

HELMINTHOLOGICAL ABSTRACTS

incorporating
BIBLIOGRAPHY OF HELMINTHOLOGY
For the Year 1949



COMMONWEALTH BUREAU OF AGRICULTURAL PARASITOLOGY
(HELMINTHOLOGY)

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November, 1949

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HELMINTHOLOGICAL ABSTRACTS *incorporating* BIBLIOGRAPHY OF HELMINTHOLOGY

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HELMINTHOLOGICAL ABSTRACTS

Vol. 18, Part 2

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PRINCIPAL CONTENTS

GENERAL SUBJECTS

Anthelmintics, 53c, 60c, 61a, 61b, 64c, 64d, 75a, 81d, 84b, 84c, 87a, 87b, 92f, 92 o, 93a, 94a, 94b, 97a, 97b, 103a, 119a, 122a, 123b, 123d, 123f.
Bionomics, 55a, 74b, 89d, 91a, 101a, 117a.
Control, 51b, 56a, 76a, 98b, 110a, 110b, 123a, 127a.
Immunity & Immunology, 53b, 58a, 77a, 85a, 90a, 92e, 105a, 107b, 114c, 114g.
Histology, 120d, 126a.
Life-Histories, 81a, 92g, 92h, 92 l, 92p, 96a, 102d, 123e.
Nematicides (plant eelworm), 51c, 89g, 99a, 105b, 105d, 105f, 105h, 105i, 112a.
Pathology, 55a, 84a, 86a, 89e, 92k.
Physiology & Metabolism, 88a, 102c, 102f, 107a, 108a, 108b, 108c.
Technique, 52a, 89i, 102e, 109a, 119a, 120e.
Treatment, 97b.

HOST DISTRIBUTION

Animals of Economic Importance

Domestic animals, 123a, 128.
Horse, 56a, 123d, 125a.
Donkey, 114f.
Cattle, 81d, 84a, 92k.
Buffalo, 81d.
Sheep, 75a, 84a, 85a, 87a, 87b, 122a, 123f.
Goat, 123b.
Poultry, 92e, 107b.
Dog, 84b, 84c, 92m, 102b, 103a.
Cat, 84d, 122b.
Laboratory animals, 90a, 92h, 92u, 93a, 109a.

Man, 53a, 53b, 54a, 55a, 58a, 59a, 60c, 61b, 62a, 64a, 64b, 64c, 64d, 86a, 89a, 89f, 92d, 92f, 94a, 94b, 95a, 97a, 100a, 106a, 114a, 114h, 115a, 116a, 119a, 121a, 121b, 121c.

Other Vertebrate Hosts

Mammals, 67a, 74b, 92a, 92b, 92q, 92s, 102b.
Birds, 89b, 89c, 89e, 92c, 92 l, 92n, 92r, 120b.
Reptiles, 114e.
Amphibians, 102a.
Fishes, 120c.

Invertebrates, 69a, 92i.

Plants, 51b, 51c, 65a, 76a, 77a, 78a, 84a, 89g, 89h, 89i, 91a, 98a, 98b, 99a, 102g, 104a, 105, 112a, 117a, 118a, 127a.

Free-Living Eelworms, 71a, 101a, 127b.

SYSTEMATICS, NEW SPECIES etc.

Trematoda, 92 l, 92n, 96a, 114e, 120c.

Cestoda, 92j, 114h, 120b, 121a.

Nematoda, 69a, 89b, 89c, 92a, 92b, 92c, 92i, 104a, 114f.

Acanthocephala, 92r.

GEOGRAPHICAL DISTRIBUTION

EUROPE.

Britain, 89h, 91a, 102a, 102g.
Cyprus, 92q.
France, 64a.
Holland, 98a.
Spain, 114f.

AFRICA, 58a, 121c.

Kenya, 75a, 89a, 121a.
Spanish Guinea, 114a.
Sudan, 121b.

ASIA

China, 92t.
India, 73a, 89b, 89c, 111a.
Iraq, 95a.
Malaya, 89f, 100a.
Syria, 53a.

AUSTRALASIA

Australia, 123f.

PACIFIC ISLANDS, 92p.

Hawaii, 104a.
Tahiti, 64b.

NORTH AMERICA, 92a, 92b, 92c.

Canada, 67a, 117a.
Greenland, 102b.
U.S.A., 65a, 84d, 122b, 128.

WEST INDIES

Virgin Islands, 110a, 110b.

SOUTH AMERICA, 60b.

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COMMONWEALTH AGRICULTURAL BUREAUX

JOINT PUBLICATION NO. 12

PHENOTHIAZINE 1942-46: A REVIEW AND BIBLIOGRAPHY

*By J. Tweedale Edwards, M.R.C.V.S. and The Commonwealth Bureau
of Agricultural Parasitology (Helminthology)*

November, 1947. Price 4s. od. post free

HELMINTHOLOGICAL ABSTRACTS

INCORPORATING BIBLIOGRAPHY OF HELMINTHOLOGY

FOR THE YEAR 1949

Vol. 18, Part 2

50—Advisory Leaflet. Ministry of Agriculture and Fisheries. London.

- a. ANON., 1949.—“Chrysanthemum eelworm.” No. 339, 4 pp.

51—Agricultural Gazette of New South Wales.

- a. ANON., 1949.—“Common internal parasites of horses may cause ill-health. Their recognition and treatment.” 60 (4), 207-210; (5), 269-272.
b. ANON., 1949.—“Sterilization of soils in glasshouses.” 60 (5), 251-253.
c. ANON., 1949.—“Leaf nematode of chrysanthemums.” 60 (6), 293-294.

(51b) In New South Wales *Heterodera marioni* and fungi are the chief sources of loss in tomato houses. Steam sterilization by means of a spike harrow is recommended, except for clay soils. In these, eelworm is rarely serious and formalin can be injected to control fungi. D-D mixture is a cheap nematocide but fails to control fungi. Chloropicrin controls both but is expensive.

B.G.P.

(51c) The symptoms caused in chrysanthemums by *Aphelenchoides ritzema-bosi* are briefly described. Small trials have been made with two of the new organic phosphate insecticides—E605 (diethylparanitrophenyl thiophosphate) and HETP (hexaethyl tetraphosphate). They were each applied at a strength of one part to 800 parts of water to twelve heavily infected plants. No effect on the viability of the nematodes was observed with HETP, but both nematodes and eggs were killed after a single application of E605. The plants suffered no apparent damage and the disease was arrested.

M.T.F.

52—American Fertilizer.

- a. LEAVITT, F. H., 1949.—“Nitrogation, nitrojection, and soil fumigation. Their application and their results.” 110 (2), 7-8, 24.

(52a) Leavitt's article is mainly concerned with the distribution and application of nitrogen to soil, in the form of anhydrous ammonia under pressure, either added to irrigation water (“nitrogation”) or injected direct (“nitrojection”). Apparatus designed for the latter purpose is readily convertible for soil injection with nematocides.

B.G.P.

53—American Journal of Hygiene.

- a. PIPKIN, A. C. & RIZK, E., 1949.—“Vesical schistosomiasis in the Middle East with a report of two new foci in northern Syria.” 49 (3), 276-284.
b. OLIVIER, L., 1949.—“Schistosome dermatitis, a sensitization phenomenon.” 49 (3), 290-302.
c. OTTO, G. F. & MAREN, T. H., 1949.—“Studies on the chemotherapy of filariasis. Parts I-IV.” 50 (1), 92-141.

(53a) Pipkin & Rizk summarize previous records of the occurrence of vesical schistosomiasis in the Middle East and report two new endemic foci in northern Syria: one in the district around Koubour El Bid, the other near Tel-Abiad, which is 125 miles from Aleppo. In the Koubour El Bid district practically all the infected villages were on or near the Jarrahi or Sublah streams, the waters of which eventually reach the Euphrates. In the Tel-Abiad district the inhabitants are nomadic Bedouins and are likely to spread the infection to other areas. Although it is not widespread the degree of infection is high.

R.T.L.

* Titles so marked throughout this number have not been seen in the original.

(53b) Olivier has experimentally studied the reactions in 34 persons following primary exposure to infection with *Trichobilharzia stagnicolae* cercariae, and has compared them with those resulting from repeated exposures. Although the reactions to primary exposure were mild and inconspicuous, the reactions to repeated exposures were increasingly severe until typical schistosome dermatitis resulted. These experiments show that the dermatitis is a sensitization phenomenon which may persist for many years and they explain the variations in severity which have been reported.

R.T.L.

(53c) Otto & Maren describe two wartime programmes of experiments carried out on the chemotherapy of filariasis. (i) A colorimetric method capable of detecting 0.1 μ gm. antimony per gramme of tissue was evolved and was applied to a study of the absorption, excretion and tissue distribution of antimony. (ii) Large numbers of new compounds were "screened" by *in vitro* testing against the larvae of *Dirofilaria immitis*. Although the limitations of this method are fully realized it has led to the finding of the high filaricidal potency of the phenyl arsenoxides. Two of these have been developed for clinical trial, *p*-arsenobenzamide and "arsenamide", the latter being a thioglycollic acid derivative with the composition *p*-(bis-[carboxymethylmercapto]-arsino)-benzamide; these two compounds have a lower affinity for erythrocytes than has unsubstituted phenyl arsenoxide, and thus retain their microfilaricidal potency in the presence of erythrocytes. In subsequent tests of antimonial and arsenical compounds against *Litomosoides carinii* in the cotton-rat, the insoluble *p*-arsenobenzamide and its soluble derivative arsenamide showed a consistently high degree of lethal action against the adult worms, but arsenamide had little or no direct effect on the microfilariae, which persisted for nearly five months following death of the adults. Cotton-rats were found to be more tolerant of arsenic and antimony than many other species, and their parasites required higher therapeutic doses than other filariae. It was also noted that trivalent antimonials in particular appear to be more toxic for female than for male *L. carinii*. Similar tests in dogs with *Dirofilaria immitis* infection showed that trivalent antimonials quickly kill the microfilariae without killing the adult worms, although the females may be permanently sterilized. No such effect upon the adult has been reported for the arsenicals, cyanines or piperazines. Arsenamide and *p*-arsenobenzamide may kill the adults immediately, while the microfilariae may not disappear for a year or more.

E.M.S.

54—American Journal of Medicine.

- a. CARTWRIGHT, G. E., 1949.—"An unusual case of clonorchiasis with marked eosinophilia and pulmonary infiltrations." 6 (2), 259-266.

(54a) From observations on a patient with *Clonorchis sinensis*, Cartwright considers that clonorchiasis must be added to the list of agents associated with Loeffler's syndrome in man.

E.M.S.

55—American Journal of Pathology.

- a. CARTER, J. R., 1949.—"Plasma cell hyperplasia and hyperglobulinemia in trichinosis. The duration of larviposition." 25 (2), 309-323.

(55a) The first case is recorded in which plasma cell hyperplasia and hyperglobulinaemia have been observed in a patient infected with *Trichinella spiralis*. Viable adult trichinae, including gravid females, were present in the mucosa of duodenum and jejunum post mortem 115 days after the onset of the symptoms.

R.T.L.

56—American Journal of Veterinary Research.

- a. LEVINE, N. D., 1949.—"The effect of various compounds upon horse strongyle larvae in feces." 10 (36), 233-239.

(56a) Of 70 compounds tested for effect on the development of horse strongyle larvae in faeces the most effective were mercuric chloride, sodium arsenite, nicotine sulphate,

potassium iodide, sodium iodide and iodoform; 0.1% of these when mixed with faeces killed all larvae. Phenothiazine and hexylresorcinol failed to kill all larvae in 1% concentrations in faeces.

R.T.L.

57—Animal Health Leaflet. Ministry of Agriculture and Fisheries. London.

- a. ANON., 1949.—“Blackhead in turkeys.” No. 12, 2 pp. [Revision of *Adv. Leaflet. Minist. Agric. Fish., Lond.*, No. 20.]
- b. ANON., 1949.—“Stomach worms in sheep (parasitic gastritis).” No. 21, 3 pp. [Revision of *Adv. Leaflet. Minist. Agric. Fish., Lond.*, No. 275.]
- c. ANON., 1949.—“Worms in poultry.” No. 22, 5 pp. [Revision of *Adv. Leaflet. Minist. Agric. Fish., Lond.*, No. 317.]

58—Annals and Magazine of Natural History.

- a. CHAPMAN, K. H., 1949.—“*Taenia* in man in South and East Africa: a survey of the present position and of experimental work as a basis for immunization of larval hosts.” Year 1948, Ser. XII, 1 (7), 506–528.

(58a) Chapman, from a study of the literature and from personal observations, regards the present position of human taeniasis and cysticerciasis as serious in large areas of Africa. In some parts of South Africa *Cysticercus cellulosae* is becoming a danger. The situation has deteriorated steadily in recent years. The use of drugs and the recognized control measures are ineffective in these countries with their large tribal agricultural and pastoral native populations. In East Africa the degree of infection of cattle found in areas with proper methods of inspection is over 21%. In South Africa the *C. cellulosae* rate in pigs may reach over 25%. As immunization of stock cannot be applied on a satisfactory scale in African countries “pre-immunity” may offer a more hopeful basis for applied control. It is suggested that experimental work on laboratory animals on these lines might give a useful lead.

R.T.L.

59—Archives of Dermatology and Syphilology.

- a. HAND, E. A. & CRISWELL, R. H., 1949.—“Otitis externa due to *Oxyuris vermicularis*.” 59 (2), 249–250.

(59a) An officer in the U.S. Army in Burma in 1945 suffered from a mild pruritus and discharge from both ears. When examined in February 1946 both drums were intact and hearing was normal. There was a slight seroceruminous discharge from both ears. When diluted with water numerous motile threadlike worms were found by microscopical examination: these were identified as *Enterobius vermicularis*. No ova were found in this material, around the anal orifice, or in dirt from under the nails.

R.T.L.

60—Boletín de la Oficina Sanitaria Panamericana.

- a. MAZZOTTI, L., 1949.—“Evaluación de nuevas drogas para las filariasis.” 28 (1), 20–26. [English summary p. 26.]
- b. PÉREZ FONTANA, V., 1949.—“Origen, desarrollo y extensión de la hidatidosis en América.” 28 (2), 124–156. [English summary p. 156.]
- c. BURCH, T. A., 1949.—“Experimental therapy of onchocerciasis with suramin and hetrazan.” 28 (3), 233–248. [Spanish summary pp. 247–248.]

(60b) The morphology, biology and systemic reactions of hydatid infection are briefly reviewed. It seems probable that the infection was first introduced into America by dogs belonging to whalers who settled on the banks of the River Plate. The factors which determine the spread of the disease in the South American continent are considered.

R.T.L.

(60c) In the endemic zone in Guatemala eight out of nine onchocerciasis patients were free from microfilariae at the end of a course of treatment with 20–50 mg. per kg. of hetrazan, but 7–8 months later only four were still negative. Fifteen out of 29 patients who were treated with 0.14 gm. or more per kg. of suramin were free, and 11 out of 12

examined 7-8 months later were still negative. Both drugs caused pruritus, induration and an acute exacerbation of the ocular manifestations of the disease. Several of the patients refused to complete the course of treatment.

R.T.L.

61—British Journal of Pharmacology and Chemotherapy.

- a. CHANCE, M. R. A. & MANSOUR, T. E., 1949.—“A kymographic study of the action of drugs on the liver fluke (*Fasciola hepatica*).” 4 (1), 7-13.
- b. BLAIR, D. M., HAWKING, F., MEESER, C. V. & ROSS, W. F., 1949.—“Miracil. Clinical trial on patients infected with *Schistosoma haematobium* and *S. mansoni*.” 4 (1), 68-80.

(61a) As fresh *Fasciola hepatica* of bovine origin give rhythmical kymographic records for at least two hours in Ringer's solution at a pH range of 6.5-8.5, the anthelmintic effect of drugs can be tested by allowing them to act for a maximum period of 45 minutes. The addition of amphetamine at the end of this period restores rhythmical activity where the drug has only a paralysing action on the fluke. In this way it is possible to distinguish between stimulant, paralysant and lethal drugs. Chlorinated hydrocarbons combine a stimulant action at low concentrations with lethal action at higher concentrations. *Fasciola hepatica* is sensitive to all drugs which affect *Ascaris*, and also to umbelliferone, pelletierine, extract filix mas and gentian violet, probably because these act as protoplasmic poisons. Of the drugs tested only phenothiazine and those lethal to bilharzial worms were inactive.

R.T.L.

(61b) From a series of clinical tests in Southern Rhodesia it is concluded that miracil-D exerts a valuable therapeutic effect on infections with *Schistosoma haematobium*, in doses which are well tolerated. Toxic symptoms seem to depend on individual idiosyncrasy. With a dose of at least 10 mg. per kg. body-weight daily the therapeutic effect was marked and in a high proportion of the patients the eggs were sterilized. The effect on *S. mansoni* was not clearly indicated as only one out of 11 cases so far treated in Southern Rhodesia was cured.

R.T.L.

62—British Journal of Radiology.

- a. McMENEMEY, W. H. & VICKERS, A. A., 1949.—“Cysticercosis. Discussion and presentation of a case.” 22 (254), 84-87.

(62a) Clinical and pathological data are given of a case of cysticerciasis epilepsy with cerebral lesions in which calcification was confined to minute calcified nodules. The patient had served in the British Army in India.

R.T.L.

63—Bulletin et Mémoires de la Société Médicale des Hôpitaux de Paris.

- a. CATTAN, R., FRUMUSAN, P. & COUSIN, R., 1949.—“Syndrome de Loeffler symptomatique d'ascaridiose au décours d'un infarctus pulmonaire suppuré.” 4e Série, 65 (1/2), 27-29.

64—Bulletin de la Société de Pathologie Exotique.

- a. HARANT, H. & MIDROUILLET, 1949.—“Sur un nouveau cas de coenurose humaine.” 42 (5/6), 173-174.
- b. GALLIARD, H., MILLE, R. & ROBINSON, W. A., 1949.—“Recherches sur la filariose à Tahiti. (Note préliminaire).” 42 (5/6), 174-178.
- c. GALLIARD, H. & MILLE, R., 1949.—“Essais de traitement de la filariose à *Wuchereria bancrofti* var. *pacifica* par le 1-diéthyl carbamyl, 4-méthyl pipérazine, à Tahiti.” 42 (5/6), 304-313.
- d. BRYGOO, E., 1949.—“Essai de traitement de la filariose (*F. loa* et *F. perstans*) par le 3.799 R.P.” 42 (5/6), 313-317. [Discussion pp. 317-323.]

(64a) Harant & Midrouillet report a case of coenuriasis which was revealed during a routine medical examination of a peasant from the Tarn at the hospital of Albi. The cyst was situated in the region of the left deltoid and was about the size of a pigeon's egg. While being removed surgically the cyst burst and emitted a clear liquid. Inside were seen 10-20 white granules about the size of a pin-head. The coenurus is identified as the larval stage of *Multiceps serialis*.

J.J.C.B.

(64b) Examination of 916 inhabitants (the total population with the exception of children of 1-5 years) of Paea district in Tahiti revealed a microfilarial index of 30.3% with *Mf. bancrofti* var. *pacifica*. Clinical signs were present in 20% and comprised 18.8% with lymphangitis and 9% with elephantiasis. Of those positive for microfilariae in the peripheral blood 57% were males. The highest infection rate lies with the group aged 21-30 years, but often it is in the very old people that the most intense microfilarial infection occurs. Lymphangitis is first seen at the age of six years and not beyond 25 years. The first signs of elephantiasis are seen at 15 years but in most cases it appears at the age of 40. While 46% of cases of lymphangitis plus elephantiasis are positive, only 32% of cases of lymphangitis without elephantiasis are positive; moreover, no cases of elephantiasis without lymphangitis are positive, so that it would appear that lymphangitis is a sign of recent reinfection. Five species of mosquitoes were found of which three are common (*Aedes pseudo-scutellaris*, *A. aegypti* and *Culex fatigans*), and two are rare (*Culex annulirostris* and *C. sitiens*). *A. pseudo-scutellaris* is the major vector and is found naturally infected in a high degree. J.J.C.B.

(64c) Galliard & Mille report upon the action of hetrazan on *Wuchereria bancrofti* var. *pacifica* in Tahiti. In doses of 2 mg. per kg. body-weight three times a day there is a rapid disappearance of microfilariae in from 48 hours to 7 days. Relapses, light in nature, occur in 40% of cases where the dosage has been insufficient. More important is the occurrence of 14% of relapses four months after a single treatment, but as the microfilariae are not rendered resistant subsequent treatment is effective. Against the clinical symptoms of the infection good effects have been obtained in treating early cases and also to some extent in chronic cases of lymphadenitis and lymphangitis, but treatment was ineffective in cases of lymphochyluria and elephantiasis. J.J.C.B.

(64d) Brygoo reports upon the action of hetrazan against microfilariae of *Loa loa* and *Acanthocheilonema perstans* when administered to five carriers of this dual infection. The treatment was clearly effective against *Mf. loa* but was less effective or ineffective against *Mf. perstans*. A dosage of 10 mg. per kg. body-weight was well tolerated. In three of the cases observed there was an increase in the numbers of polynuclear eosinophiles, which is taken to be related to the lysis of the microfilariae. J.J.C.B.

65—California Agriculture.

- a. ALLEN, M. W., 1949.—"Root-lesion nematodes; resistant rootstocks most promising method of control." 3 (1), 8, 14.
- b. HOWELL, C. E., 1949.—"Horses; stomach worms controlled." 3 (3), 16.

(65a) Allen states that in recent years it has become increasingly recognized that root-lesion nematodes, including *Pratylenchus pratensis*, *P. musicola* and possibly other species, are probably responsible for the unthriftness and slow decline of various fruit trees in California. Large necrotic lesions are characteristic of the larger roots of cherry, fig, olive and walnut whilst the injury to apple, apricot, peach and grape is chiefly confined to the feeder roots. The nematodes are probably spread by irrigation water and other cultural practices. Control is difficult by chemical means as the host may be killed by chemical methods such as fumigation. In the case of replanting, however, chosen sites can be spot-fumigated prior to replanting with clean stock. Tests are now being made to find root stocks resistant to root-lesion nematodes. T.G.

66—California Veterinarian.

- a. HOBMAIER, M., 1949.—"Parasitic nematodes common to man and domestic animals." 2 (3), 22-23.

67—Canadian Journal of Comparative Medicine.

- a. MOYNIHAN, I. W. & MUSFELDT, I. W., 1949.—“A study of the incidence of trichinosis in rats in British Columbia.” 13 (6), 152-155.

(67a) There is a relatively high incidence of trichinosis in man in Vancouver, B.C. Moynihan & Musfeldt report the details of their survey of the incidence in local rats [see also Helm. Abs., 18, No. 9b]. They examined the diaphragms of 260 rats, of which 171 were taken from four piggeries, 82 were from five garbage dumps, and seven were collected elsewhere. *Trichinella spiralis* cysts were detected in 25% of the 260 diaphragms. Of the 171 rats from the piggeries, 57 (33.3%) were positive, the infection being heavy in ten and light in 47. Of the 82 rats taken from the garbage dumps, eight (9.8%) were positive and one only was heavily infected. None of the seven rats which were collected from a waterfront, a park, a road junction and a small town were infected. R.T.L.

68—Canadian Journal of Public Health.

- a. KUITUNEN-EKBAUM, E., 1949.—“A case of *Dipylidium caninum* in a child.” 40 (3), 115-116.

69—Canadian Journal of Research. Section D, Zoological Sciences.

- a. BASIR, M. A., 1949.—“A redescription of *Cephalobellus brevicaudatus* (Leidy, 1851) Christie, 1933 (Nematoda), with comments on other species of the genus *Cephalobellus*.” 27 (2), 31-36.

(69a) After discussing the systematic relationships of the genus *Cephalobellus* Cobb and its earlier synonyms, Basir gives an illustrated description of the female of *C. brevicaudatus* from the gut of a cockroach, *Leucophaea* sp. He also provides a key to the species of the genus. *Thelastoma indiana* and *C. lloydi* are reduced to synonymy with *C. brevicaudatus*. T.G.

70—Circular. Oklahoma Agricultural Experiment Station.

- a. BRIGGS, H. M. & HARMON, K. S., 1949.—“Control of parasites and diseases of sheep.” No. C-132, 15 pp.

71—Comptes Rendus des Séances de l'Académie des Sciences. Paris.

- a. NIGON, V., 1949.—“Effets de la polyploidie chez un nématode libre.” 228 (13), 1161-1162.

(71a) Nigon reports that amongst hermaphrodite adults of the free-living nematode, *Rhabditis elegans* Maupas, which had been kept at a temperature of 25°C. for 24 hours, there appeared a hermaphrodite specimen of weak reproductive power; it produced only 22 offspring. These, however, were of large size and were found to be tetraploids with 24 chromosomes. The line thus established has maintained itself by self-fertilization for 36 generations and continues to reproduce. Fecundity in these tetraploids is always lower than in the normal diploids. Certain hermaphrodites give rise to lines exclusively hermaphroditic, others give lines in which the proportion of males to females varies greatly. Details are given of two line selections in one of which, on self-fertilization, the proportion of males was high whereas in the other there were no males. Thus from 165 hermaphrodites of a given line, 102 gave a total of 706 males and 1,212 hermaphrodites, i.e. 36.8% males; the other 63 specimens gave 825 hermaphrodites and no males. Dwarf mutants have also been encountered and the author finally suggests that further cross-fertilizations are needed to resolve the genetic constitution of the various lines and stocks. T.G.

72—Comptes Rendus des Séances de la Société de Biologie. Paris.

- a. BRUMPT, L. C., 1949.—“Présence de *Mansonella ozzardi* chez une femme de la Guadeloupe.” 143 (7/8), 468-469.
b. COUDERT, J. & JUTTIN, P., 1949.—“A propos des méthodes d'enrichissement des sels.” 143 (7/8), 496-497.

(72b) [A similar paper has already appeared in *Bull. Soc. Path. exot.*, 1949, 42 (3/4), 111-114. For abstract see Helm. Abs., 18, No. 7f.]

73—Current Science. Bangalore.

- a. ANANTARAMAN, M. & BALASUBRAMANIAM, G., 1949.—“A study of *Cercaria fraseri* Buckley, 1939 in Madras.” [Correspondence.] 18 (4), 124–126.

(73a) Anantaraman & Balasubramaniam record the finding of a diplocotyle amphistome cercaria from *Indoplanorbis exustus* in various localities in the vicinity of Madras, and identify it with *Cercaria fraseri* originally found in *I. exustus* in Assam. They state that the cercaria described as new by Peter & Mudaliar [Helm. Abs., 17, No. 182b] is in reality *C. fraseri*. Feeding a buffalo calf and a piglet with encysted cercariae of *C. fraseri* and *C. Indica* XXVI produced no infection in the piglet but resulted in *Cotylophoron cotylophorum*, apparently derived from *C. Indica* XXVI, in the calf. Ecological and morphological data are discussed in relation to the ultimate determination of the identity of the adult of *C. fraseri*. J.J.C.B.

74—Deutsche Tierärztliche Wochenschrift.

- a. HONEKER, A., 1949.—“Phenothiazin als neues Mittel zur wirksamen Behandlung der Magenwurmseuche der Ziegen (eine Literaturübersicht).” 56 (19/20), 155–157.
b. NICKEL, 1949.—“Über einen Elefantentrematoden der Gattung *Hawkesius*.” 56 (23/24), 184–186.

(74b) Two types of large trematodes were found in the intestine of an Indian elephant autopsied after being 20 years in Europe. One type was present in considerable numbers and is described and identified as a species of *Hawkesius*. E.M.S.

75—East African Agricultural Journal.

- a. DUTHY, B. L., 1949.—“Field trials with phenothiazine (P.T.Z.) given as a lick to sheep.” 14 (4), 196–200.

(75a) Duthy reports on experiments which were conducted in Kenya to assess the value of incorporating phenothiazine in a salt lick for the control of worms. Lambs which were dosed regularly with “wireworm remedy” and had access to a salt lick containing phenothiazine at the rate of 1 in 200 put on more weight than those which received only wireworm remedy and salt lick. Phenothiazine salt lick (1 in 200) alone proved less efficient than wireworm remedy. Phenothiazine salt lick (1 in 100) proved equal to wireworm remedy while the flock was on wet grazing and consumed more lick. At a lower elevation where less lick was consumed, the 1 in 100 lick was inadequate but a 1 in 50 lick was equal to the use of wireworm remedy supplemented by the 1 in 200 lick. Duthy considers that the salt intake of sheep in various parts of Kenya at different seasons must be ascertained before the anthelmintic value of phenothiazine in licks can be assessed. P.L.I.E.R.

76—Farmers' Bulletin. U.S. Department of Agriculture.

- a. WALKER, J. C., 1949.—“Diseases of cabbage and related plants.” No. 1439, 38 pp. [Revised.]

(76a) Of the diseases of cabbages in the United States, root-knot due to *Heterodera marioni* is most common on crops grown on the light sandy soils in the South. In the northern States it occurs chiefly in greenhouses. The root swellings are generally smaller than those due to clubroot and are more uniformly distributed on the lateral feeding roots. A crop rotation of at least three years is recommended, accompanied by clean cultivation to keep down weeds. Immune or highly resistant crops advised for rotations are barley, beggarweed, chufa, maize, cowpea, crabgrass, Bermuda grass, nearly all grasses, kaffir, nearly all millets, milo, winter oats, peanut, rye, sorghum, Laredo soybean, velvet bean and wheat. Infected seedbeds and greenhouses should be sterilized by live steam.

• R.T.L.

77—Fruits et Primeurs de l'Afrique du Nord. Edition Marocaine.

- a. BRICHET, J., 1949.—“La lutte contre les ‘anguillules’ par l'emploi de porte-greffes résistants.” 19 (198), 6–8.

(77a) Brichet reviews the available information about root-knot resistant root-stocks for apricots, plums, almonds, cherries, pears, apples, quinces, walnuts and peaches. The

most research has been done on peaches, and certain strains of the three varieties Shalil, Bokhara and Yunnan have been found which are resistant and are being propagated in America for use as root-stocks.

M.T.F.

78—Gardening Illustrated.

- a. FRASER, H., 1949.—“Currant eelworm and midge.” 66 (3), 56.

(78a) Fraser gives a short popular account of the injury to blackcurrant caused by eelworm [*Aphelenchoides ribes*] and warns that cuttings should not be taken from infested bushes. If there is any likelihood of the cuttings being infested they should be immersed for 30 minutes in water at 110°F. to kill the nematodes.

M.T.F.

79—Grower. London.

- a. REID, R. D., 1949.—“Breeding disease resistant strawberries.” 31 (9), 398–400.

(79a) [This is a summary of a paper which appeared in *J. Minist. Agric.*, 1949, 55 (11), 476–482. For abstract see *Helm. Abs.*, 18, No. 242.]

80—Indian Medical Gazette.

- a. CHAUDHURI, R. N., 1949.—“Notes on some remedies. XXVIII.—Drugs in helminthic diseases, Part III.” 84 (4), 154–156.

(80a) Chaudhuri continues his summary of drugs used in helminth diseases, dealing briefly with the dosage and methods of administration of those commonly used for ascariasis, oxyuriasis, hookworm, strongyloidiasis, taeniasis and *Wuchereria bancrofti*. The article concludes with “general instructions on the use of intestinal anthelmintics”.

R.T.L.

81—Indian Veterinary Journal.

- a. RAO, S. R., 1949.—“A short note on *Musca viscina* as the possible vector of *Thelazia* sp.” 25 (6), 399–401.
 b. ALWAR, V. S., 1949.—“Amphistomiasis. (A review of the literature.)” 25 (6), 417–424.
 c. NARASU, G. V., 1949.—“Helminthiasis in puppies—treatment with homoeopathic drugs.” 25 (6), 450–451.
 d. SEN, M. R., 1949.—“Nasal schistosomiasis—treatment with tartar emetic.” 25 (6), 453–456.

(81a) About six larval nematodes were found in the head of one specimen of *Musca vicina* out of hundreds examined. These showed coarse transverse striations on the cuticle similar to those characteristic of *Thelazia* sp. and differing from the adult *Allantonema musca* and *A. stricklandi* reported from the body-cavity of *M. vicina* by Roy & Mukherjee (1937).

R.T.L.

(81d) In villages in Jhargram Subdivision of Midnapore district of Bengal, clinical symptoms of nasal granuloma due to *Schistosoma nasalis* were observed in 20–60% of the cattle, but in none of 500 buffaloes. Microscopically, eggs were detected in 100% of the cattle showing symptoms and in 90% of the buffaloes without symptoms. Treatment by tartar emetic usually resulted in cure after six injections of 1–1½ grains per 100 lb. body-weight at intervals of 1–2 days, but relapses or reinfection occurred in the following year in about 45%.

R.T.L.

82—Journal of the American Chemical Society.

- a. SZMANT, H. H. & HALPERN, A., 1949.—“Ascaridole in oil of chenopodium. III. The characterization of ascaridole.” 71 (3), 1133–1134.

83—Journal of the American Medical Association.

- a. LOUGHLIN, E. H. & SPITZ, S. H., 1949.—“Diagnosis of helminthiasis.” 139 (15), 997–1000. [Discussion p. 1000.]

84—Journal of the American Veterinary Medical Association.

- a. SHAW, J. N. & MUTH, O. H., 1949.—“Some types of forage poisoning in Oregon cattle and sheep.” 114 (866), 315-317.
- b. KINGMA, F. J., 1949.—“Observations in treating canine filariasis.” 114 (866), 322-325.
- c. JACKSON, R. F., 1949.—“The treatment of heartworm-infected dogs with arsenamide, a phenyl arsenoxide.” 115 (868), 17-22.
- d. TURK, R. D., 1949.—“Liver flukes from a cat.” 115 (868), 23.

(84a) Shaw & Muth describe the symptoms and lesions associated with the feeding of certain fodders, including fescue (*Festuca rubra commutata*) screenings, to cattle and sheep. Sheep developed nervous symptoms, falling, trembling of muscles and marked incoordination; ewes aborted. Examination of the fescue screenings which produced mortality in experimentally fed sheep revealed the presence of the plant nematode *Anguina* [= *Anguillulina*] *agrostis*. The post-mortem lesions in three of these animals were extensive haemorrhages in the large intestine, under the endocardium and in the gall-bladder. Animals which received uninfected fescue seed remained normal. Nematodes collected from the infested material by placing the seed in water were ground up, filtered through glass and the filtrate injected intrajugularly into one sheep, with negative results. P.L.ler.

(84b) Kingma refers to the difficulty of evaluating the efficiency of drugs in the treatment of *Dirofilaria immitis* in dogs. He reports success from using foudadin continuously until the appearance of severe toxic symptoms—loss of appetite, frequent and increased micturition, depression, diarrhoea, oedema of lips, muscle soreness, extreme swelling of the scrotum in males, and marked loss of weight. As microfilariae disappear from the blood before toxic symptoms develop, the daily administration of foudadin can be discontinued within 2-3 days of the appearance of toxic symptoms, the time to stop injections being indicated by a rapid rise in the number of leucocytes from about 15,000 per cu.mm. to 30,000 or even more within 24 hours. This rise is due to an increase in the number of neutrophils while the eosinophils have decreased in number; the red count remains unaffected by treatment. Normal saline, glucose in saline, and possibly an amino acid to counteract excessive weight loss, are injected in large quantities as soon as this reaction appears. The author considers that the adult worms, rather than the microfilariae, are responsible for the clinical manifestations of dirofilariasis immitis. P.L.ler.

(84c) Jackson reports on the treatment of 50 dogs of varying ages and breeds and in varying stages of the disease with arsenamide (T.D.C. No. 970) for dirofilariasis immitis. A 1% solution of the drug was administered intravenously at the rate of 2.25 mg. per kg. body-weight. Treatment was well tolerated. Eleven dogs developed a transitory cough and two a temporary stiffness in the hind legs. Of the seven dogs which were in a critical condition previous to treatment, six died; the other animal improved. The drug failed to destroy the microfilariae and foudadin was used to kill them. Arsenamide proved less promising in long-standing infections than in early infections, especially in young dogs. P.L.ler.

(84d) In a cat which had marked dyspnoea and severe jaundice a large number of *Amphimerus pseudofelineus* were found post mortem. This is the first record of this fluke in Texas. R.T.L.

85—Journal of Animal Science.

- a. EMIK, L. O., 1949.—“The effects of environmental and hereditary factors on trichostrongylid worm infestation in sheep.” 8 (1), 73-80.

(85a) Emik has examined trichostrongyle egg counts, from 101 lambs, based on twelve weekly faecal samples collected from June onwards. Duplicate dilution counts made by a modified Caldwell method were shown to conform to the Poisson distribution, and a square-root transformation was therefore used in analysis. Available factors were: sheep, weeks, sex, breed, sire, and class (mutton or wool), these with their interactions yielding a highly

complex analysis. Variation between sheep and between weeks was significantly greater than error, the time curves being parallel for sex and breed within class, but not for class. Males were more infested than females and showed more significant breed differences. The factors sex, breed and sire were also significant, but not class. Heritabilities, by the half-sib correlation method, were not significant but this does not preclude a genetic control of resistance. B.G.P.

86—Journal of Clinical Pathology.

- a. LANDELLS, J. W., 1949.—“Intra-medullary cyst of the spinal cord due to the cestode *Multiceps multiceps* in the coenurus stage. Report of a case.” 2 (1), 60–63.

(86a) Landells adds interesting clinical and histopathological details to the previous report [see Helm. Abs., 17, No. 94b] of an intramedullary coenurus in the spinal cord of a 14-years-old girl of Gillingham, Kent. More details are also given of Clapham's cerebral case [see Helm. Abs., 10, No. 249e] and of a case of cerebral coenuriasis in sheep, and it is inferred from these that the clinical course of the present case and the non-recovery of the patient after removal of the cyst are due to the fact that a chronic granulomatous inflammation at least three inches deep around a coenurus is of greater functional importance in the spinal cord than in the brain. H.C.

87—Journal of Comparative Pathology and Therapeutics.

- a. POLLARD, E. P., OWEN, R. W. & EVANS, G. O., 1949.—“Phenothiazine for the control of helminthiasis in lambs: monthly dosing compared with a phenothiazine-salt mixture.” 59 (1), 54–69. [Appendix p. 69, by M. T. Thomas.]
b. PAGE, K. W., 1949.—“The anthelmintic effect of phenothiazine administered in small daily doses to lambs bearing heavy infestations of *Haemonchus contortus*.” 59 (1), 70–80.

(87a) Pollard et al. compare the merits of a 1 in 10 phenothiazine-salt mixture with those of monthly dosing with phenothiazine for the control of gastro-intestinal helminths in lambs on a third-year ley composed of timothy, cocksfoot, Italian and perennial ryegrass, and red and wild white clover. The animals were infested predominantly with species of *Ostertagia*, *Trichostrongylus* and *Nematodirus* but most of them harboured also small numbers of *Cooperia*, *Monodontus* [syn. *Bunostomum*], *Oesophagostomum*, *Chabertia* and *Trichuris*. The absence of *Haemonchus* is attributed to the routine dosing of the flocks on the farm with phenothiazine for some time before the lambs were born. It is claimed that monthly dosing was more efficient than the phenothiazine-salt mixture in reducing the mean egg count and the worm load, while the mixture proved the more efficient in reducing pasture infection. It is considered that the provision of a phenothiazine-salt mixture may prove beneficial in cases where regular monthly dosing is impossible. P.L.ler.

(87b) Page records experiments to assess the anthelmintic efficiency of daily small doses of phenothiazine, administered in gelatin capsules to lambs infested with *Haemonchus contortus*. The anthelmintic was administered at the rates of 0.25 gm. and 0.5 gm. per day for 14 days before and 70 days after artificial infestation, and from the 42nd to the 70th day after infection in separate tests. The effects of the various methods of treatment on egg output, action on larval development in the faeces, body-weight gains and post-mortem worm counts in the various groups are recorded. The author concludes that daily dosage with 0.25 gm. phenothiazine “reduced the level of established helminth infestations, but did not reduce the degree of parasitism below that of a clinical infestation”. He believes that the daily administration of 0.5 gm. of the drug should protect lambs against natural infestation where the degree of infestation in the pasture is “not too high”. P.L.ler.

88—Journal of Experimental Biology.

- a. SMYTH, J. D., 1949.—“Studies on tapeworm physiology. IV. Further observations on the development of *Ligula intestinalis* *in vitro*.” 26 (1), 1–14.

(88a) Smyth gives a detailed account of the factors governing the *in vitro* development of plerocercoids of *Ligula intestinalis* from the roach. The best nutrient medium was

horse serum, probably because of its high buffering properties. In this 6% of the eggs produced were fertile: even fragments of larvae, or larvae without scolex or posterior half, developed to the stage of oviposition. Certain bacterial infections of the medium had no detrimental effect on development but others were toxic. Fresh plerocercoids contained large amounts of glycogen. During cultivation very large quantities of cytoplasmic fat were produced, even in saline. Unidentified acid by-products slowed down development and, if present in sufficient quantity, caused death.

R.T.L.

89—Journal of Helminthology.

- a. BUCKLEY, J. J. C., 1949.—“Studies on human onchocerciasis and *Simulium* in Nyanza Province, Kenya. I. Distribution and incidence of *O. volvulus*.” 23 (1/2), 1-24.
- b. SINGH, S. N., 1949.—“Studies on the helminth parasites of birds in Hyderabad State. Nematoda III.” 23 (1/2), 25-38.
- c. SINGH, S. N., 1949.—“Studies on the helminth parasites of birds in Hyderabad State. Nematoda IV.” 23 (1/2), 39-56.
- d. KENDALL, S. B., 1949.—“Bionomics of *Limnaea truncatula* and the parthenitae of *Fasciola hepatica* under drought conditions.” 23 (1/2), 57-68.
- e. CLAPHAM, P. A., 1949.—“On *Capillaria cadovolvata*, pathogenic to *Perdix perdix*.” 23 (1/2), 69-70.
- f. SANDOSHAM, A. A., 1949.—“A case of human gnathostomiasis in Malaya.” 23 (1/2), 71-72.
- g. PETERS, B. G., 1949.—“Potato root eelworm, D-D, and soil sterilization. III. Results for 1947.” 23 (1/2), 73-88.
- h. GOODEY, T., & GOODEY, J. B., 1949.—“Tuber-rot eelworm of potato and its weed hosts.” 23 (1/2), 89-90.
- i. FRANKLIN, M. T., 1949.—“A quick method of demonstrating nematodes of the genus *Aphelenchoides* in leaves.” 23 (1/2), 91-93.

(89a) Buckley made a survey of the distribution of *Onchocerca volvulus* in Nyanza Province, Kenya, by skin biopsy diagnosis in population samples from various parts of the province. Five foci of infection are mapped, one of which was hitherto unknown. The foci are well circumscribed and are situated at 4,000-6,000 feet above sea-level. These limitations are correlated with the restricted range of distribution of the vector, *Simulium neavei*. An account is given of the incidence of the infection in four of the five foci, and differing incidences and clinical effects are commented upon. Age-group analysis showed a progressive increase in incidence with age and, with one exception, each focus shows a higher incidence in males than in females.

J.J.C.B.

(89b) Singh records for the first time from India and redescribes the avian nematodes *Hadjelia truncata*, *H. inermis*, *Viguiera euryoptera* and *Microtetrameres inermis*. The last-named species was found in two new hosts, *Temenuchus pagodarum* and *Brachypternus bengalensis*. Detailed descriptions are given of *Syphaciella indica* and *Quasithelazia tenuis*: the genus *Quasithelazia* Maplestone is reduced to synonymy with *Schistorophus* Railliet, 1916. *Physaloptera alata* was collected from the type-host, *Accipiter nisus* and is redescribed.

J.J.C.B.

(89c) In the last of this series of studies on avian helminths Singh describes four new species and two new genera belonging to the family Filariidae, and one new species in the family Dracunculidae. A new host, *Lanius vittatus*, is recorded for *Diplotrriaena tricuspis*. The new helminths are as follows: *Buckleyfilaria buckleyi* n.g., n.sp. from *Copsychus saularis*, *Eufilaria asiatica* n.sp. from *Corvus splendens*, *Lerouxinema lerouxi* n.g., n.sp. from *Galloperdix spadicea*, *Splendidofilaria brevispiculum* n.sp. from *Streptopelia decaocto*, and *Avioserpens multipapillosa* n.sp. from *Ardeola grayii*. *Squamofilaria coronata* was collected from a new host in India, *Coracias benghalensis*, and this worm is described in detail and is discussed in relation to early descriptions.

J.J.C.B.

(89d) Kendall shows that under drought conditions in the laboratory newly hatched *Limnaea truncatula* can survive for at least two months, and half-grown snails (0.3-0.5 cm.) remain alive for up to one year. In favourable conditions in the laboratory young snails grow rapidly and commence egg-laying 21 days after they have hatched. Each egg mass

contains up to 25 eggs which hatch in 12-13 days. Many egg masses are laid and one snail was observed to produce 394 eggs in 16 days. The rapidity of growth and reproduction, together with the self-fertility of the snails, are factors ensuring quick repopulation in the event of heavy mortality caused by a drought. In experiments set up to determine whether *Fasciola hepatica* could survive the dry-period dormancy of the snail host, rediae and cercariae were demonstrated in snails aestivating for up to ten months. It was found that the infection with *F. hepatica* not only survives but development of the parasite proceeds, although at a slower rate than in a normal environment. J.J.C.B.

(89e) Clapham describes pathological changes in the caeca of a partridge (*Perdix perdix*) caused by *Capillaria cadovulvata*. The worms had penetrated into the serous layers causing inflammation and necrosis. P.A.C.

(89f) Sandosham describes a second case of human gnathostomiasis in Malaya. The helminth is believed to be a larval *Gnathostoma spinigerum*. It was living under the skin of a finger, and had apparently travelled from the nail bed leaving a raised linear track behind it. P.A.C.

(89g) A factorial experiment to test the effects on potatoes of steam sterilization, infection with *Heterodera rostochiensis* cysts, and injection of D-D mixture was carried out in 1946 [see Helm. Abs., 17, Nos. 311a & b]. Potatoes were again planted in 1947, with the addition of fertilizers as a fourth factor. Peters shows that the first year's findings were reversed: eelworm infection had a significant negative effect, and the good results of both steaming and the "soil-amendment" component of D-D injection did not re-appear. In addition to the positive fertilizer effect, a negative fertilizer/eelworm interaction is interpreted as a wastage, some of the fertilizer being used in effect for the production of eelworm cysts. B.G.P.

(89h) Goodey & Goodey report briefly the experimental transfer of the potato tuber-rot eelworm *Ditylenchus destructor* Thorne, 1945 to the rhizomes of the corn mint, *Mentha arvensis* L., also its first recorded presence in the Fens in England on the rhizomes of *M. arvensis* and of a new host, corn sowthistle (*Sonchus arvensis* L.). *D. destructor* is distinguished from *Anguillulina dipsaci* by six incisures instead of four on the lateral fields. This difference and the lesions on mint rhizomes are figured. J.B.G.

(89i) *Aphelenchoides ritzema-bosi* and *A. olesistus* may be demonstrated by plunging infected leaves of the host plant into boiling lactophenol containing 0.1-0.5% acid fuchsin, differentiating in 50% alcohol and clearing in liquid phenol. The worms become strongly stained and the leaf tissue slightly so. The details of the method vary with the thickness of the leaf. M.T.F.

90—Journal of Infectious Diseases.

- a. SPRENT, J. F. A. & CHEN, H. H., 1949.—"Immunological studies in mice infected with the larvae of *Ascaris lumbricoides*. I. Criteria of immunity and immunizing effect of isolated worm tissues." 84 (2), 111-124.

(90a) Sprent & Chen assessed immunity in white mice to larvae of *Ascaris lumbricoides* from the pig by the "liver ratio" (the number of larvae found in the liver divided by the number found in liver and lungs together), by measurements of larvae in the liver and lungs, and by histological reactions. The "liver ratio" was high in the initial stages before migration to the lungs occurred. In test reinfections it remained high because the larvae did not migrate to the lungs: such larvae remained small and suffered cellular encapsulation. They were not able to produce immunity consistently in mice by active or passive immunization with whole worm extracts or extracts from various tissues. P.A.C.

91—Journal of the Ministry of Agriculture. London.

- a. THOMPSON, H. W., ROEBUCK, A. & COOPER, B. A., 1949.—“Floods and the spread of potato root eelworm.” 56 (3), 109–114.

(91a) Thompson et al. have examined for Heterodera cysts the silt and debris left by receding flood waters in the extensive floods of spring 1947, selecting areas around Selby (Yorkshire Ouse), East Ferry (Trent), Kesteven Fens (Witham), and certain Welland and Nene areas. Although potato root eelworm was the main concern, attention was paid also to the cereal root eelworm in Yorkshire and to the sugar-beet eelworm in the Welland and Nene areas. Broadly speaking there was no evidence of serious dispersal of viable cysts, which from a wet soil tend to sink in any case. Those that were found were mainly in the flotsam at flood margins. Even slight spread of the sugar-beet eelworm may be important in view of the Sugar Beet Eelworm Order, 1942.

B.G.P.

92—Journal of Parasitology.

- a. READ, C. P., 1949.—“Studies on North American helminths of the genus *Capillaria* Zeder, 1800 (Nematoda): I. Capillarids from mammals.” 35 (3), 223–230.
- b. READ, C. P., 1949.—“Studies on North American helminths of the genus *Capillaria* Zeder, 1800 (Nematoda): II. Additional capillarids from mammals with keys to the North American mammalian species.” 35 (3), 231–239.
- c. READ, C. P., 1949.—“Studies on North American helminths of the genus *Capillaria* Zeder, 1800 (Nematoda): III. Capillarids from the lower digestive tract of North American birds.” 35 (3), 240–249.
- d. HUNTER, III, G. W., SHILLAM, D. S., TROTT, O. T. & HOWELL, Jr., E. V., 1949.—“Schistosoma dermatitis in Seattle, Washington.” 35 (3), 250–254.
- e. TODD, A. C., 1949.—“Thyroid condition of chickens and development of parasitic nematodes.” 35 (3), 255–260.
- f. RIEDEL, B. B. & LUNDE, M. N., 1949.—“The comparative effect of some sulfonamides on experimental trichinosis in white mice.” 35 (3), 261–266.
- g. OLIVIER, L. & MAO, C. P., 1949.—“The early larval stages of *Schistosoma mansoni* Sambon, 1907 in the snail host, *Australorbis glabratus* (Say, 1818).” 35 (3), 267–275.
- h. YOLLES, T. K., MOORE, D. V. & MELENEY, H. E., 1949.—“Post-cercarial development of *Schistosoma mansoni* in the rabbit and hamster after intraperitoneal and percutaneous infection.” 35 (3), 276–294.
- i. BASIR, M. A., 1949.—“On a larval nematode from an insect with a note on the genera *Thubunaea* Seurat, 1914 and *Physalopteroides* Wu and Liu, 1940.” 35 (3), 301–305.
- j. RAUSCH, R. & SCHILLER, E. L., 1949.—“A critical study of North American cestodes of the genus *Andrya* with special reference to *A. macrocephala* Douthitt, 1915. (Cestoda: Anoplocephalidae).” 35 (3), 306–314.
- k. MAYHEW, R. L., 1949.—“Studies on bovine gastro-intestinal parasites XII. Additional infection experiments with the hookworm (*Bunostomum phlebotomum*) in the calf.” 35 (3), 315–321.
- l. YOUNG, R. T., 1949.—“A note concerning certain microphallid trematodes infecting shore birds (*Limosa fedoa* and *Catoptrophorus semipalmatus inornatus*) with description of a new species (*Levenseniella charadriiformis*).” 35 (4), 353–357.
- m. YUTUC, L. M., 1949.—“Prenatal infection of dogs with ascarids, *Toxocara canis* and hookworms, *Ancylostoma caninum*.” 35 (4), 358–360.
- n. PRATT, I. & CUTRESS, C., 1949.—“*Olsoniella chivosca* n.sp. (Trematoda: Dicrocoeliidae) from the western evening grosbeak.” 35 (4), 361–363.
- o. SCHREIBER, F. G. & SCHUBERT, M., 1949.—“Toxicity of some chemical compounds to cercariae of *Schistosoma mansoni*.” 35 (4), 364–366.
- p. PERRY, W. J., 1949.—“Studies on *Mansonia xanthogaster* and its relation to filariasis in the South Pacific.” 35 (4), 379–382.
- q. WATSON, J. S., 1949.—“*Tetrathyridium* larvae of *Mesocestoides* in rodents in Cyprus.” 35 (4), 383–387.
- r. BYRD, E. E. & DENTON, J. F., 1949.—“The helminth parasites of birds. II. A new species of *Acanthocephala* from North American birds.” 35 (4), 391–410.
- s. CIORDIA, H., 1949.—“Cytological study of *Rhopalias macracanthus* Chandler, 1932, a trematode from the opossum, *Didelphis virginiana*.” 35 (4), 417–422.
- t. CHEN, H. T., 1949.—“A human ocular infection by *Gnathostoma* in China.” 35 (4), 431–433.
- u. MOORE, D. V., YOLLES, T. K. & MELENEY, H. E., 1949.—“An attempt to infect mice in utero with *Schistosoma mansoni*.” 35 (4), 434.

(92a) *Capillaria rauschi* n.sp. from *Sorex cinereus* and *C. tamias-striati* n.sp. from *Tamias striatus*, both from Madison, Wisconsin, are briefly described and illustrated.

The mammillated outer shell of the egg differentiates *C. rauschi* from all other mammalian *Capillaria*. *C. tamias-striati* resembles *C. erinacei* but possesses rather stout caudal papillae, while the lateral bacillary lines are apparently absent. Read notes that the lengths of *C. linearis* male (3.8 mm.) and female (7.6 mm.) given by Neveu-Lemaire (1912), Baylis (1929) and Freitas & Lent (1936) are ten times smaller than the original measurements given by Leidy: this is due to the misplacement of a decimal point in converting from inches to millimetres. *C. hepatica* is recorded from the cotton-rat (*Sigmodon hispidus*) for the first time. Read has not been able to confirm the occurrence of *C. putorii* in the U.S.A., included by Sprehn (1932) in the geographical distribution of this species. *C. mustelorum* is redescribed. The *Capillaria* studied do not show any marked degree of host specificity. R.T.L.

(92b) Three new species of *Capillaria*, *C. michiganensis* n.sp. from *Ondatra zibethica*, *C. chandleri* n.sp. from *Citellus franklini*, and *C. americana* n.sp. from several hosts are briefly described. Two keys are given to the capillarids parasitic in North American mammals, one for males and the other for females. Descriptions are also given of *C. muris-sylvatici* from *Microtus p. pennsylvanicus* (not previously recorded from North America) and *C. bovis*, of which *C. longipes* is considered a synonym after examination of Ransom's type material. R.T.L.

(92c) Separate keys are given for the males and females of capillarids of North American birds. Two new species are described from Madison, Wisconsin, *C. quiscalis* n.sp. from *Quiscalus quiscula aeneus*, and *C. freitasi* n.sp. from *Passarella iliaca iliaca*. R.T.L.

(92d) Hunter et al. record cases of a schistosome dermatitis from Green Lake at Seattle, Washington. Cercariae of *Trichobilharzia ocellata* and *T. physellae* were encountered in *Stagnicola palustris nuttalliana* and *Physella propinqua* respectively, both new intermediaries. Both cercariae produced a schistosome dermatitis in human volunteers. What appears to be an allergic reaction was observed in two persons who had been exposed to infection a month previously. An unidentified strigeid cercaria from *S. palustris nuttalliana* failed to produce a dermatitis. P.L.L.e.R.

(92e) Todd has studied the effect of thyroactive iodocasein (Protamone) and thiouracil on the natural resistance of New Hampshire "broiler chickens" (46-58 days old) to infection with *Ascaridia galli* and *Heterakis gallinae*, and on the growth of these parasites. No significant differences were found in percentage development of the parasites, but *A. galli* attained greater lengths in mildly hyperthyroid birds while *H. gallinae* attained greater lengths in birds which were mildly hypothyroid. R.T.L.

(92f) Sulphanilamide incorporated at a 2% concentration in the diet of white mice immediately after experimental infection with 100 ± 5 *Trichinella* cysts caused an over-all larval reduction of 54%. The effect of a similar amount of sulphaguanidine was slight. Concentrations of 1% sulphathiazole and 0.5% sulphadiazine had no effect on the parasites. R.T.L.

(92g) Olivier & Mao report on the early developmental stages of *Schistosoma mansoni* in *Australorbis glabratus*. The miracidium carries 50-100 germinal cells and these divide to produce 200-400 germinal cells. Each germinal cell produces a daughter sporocyst within the mother sporocyst in the head-foot region of the snail. The daughter sporocysts on leaving the mother sporocyst migrate to the digestive gland or other organs where they elongate and enlarge and produce cercariae. The cercariae arise from separate germinal layers from the germinal cells in the daughter sporocysts. Some of the germinal cells may give rise to germinal masses which produce cercariae by a special form of polyembryony. The early developmental stages of *S. mansoni*, *Trichobilharzia stagnicolae* and *Schistosomatium douthitti* are closely similar in essential characteristics. P.L.L.e.R.

(92h) Yolles et al. report on the routes of migration and the stages of development observed in *Schistosoma mansoni* in various organs and parts of the circulation of rabbits and hamsters which had been infected percutaneously and intraperitoneally. The rate of development in rabbits was slower than in hamsters and a lower percentage of worms reached maturity, indicating that the rabbit is a less suitable host than the hamster for *S. mansoni*. In intraperitoneal infections in rabbits a lower percentage of worms reached the lungs and the portal circulation than in percutaneous infections in rabbits and in intraperitoneal and percutaneous infections in hamsters, suggesting that the parasites suffered damage in the peritoneal cavity of the rabbit. Schistosomulae were still present in the skin or adjacent subcutaneous tissues of the hamster on the fourth day after percutaneous infection and in the ear of the rabbit on the ninth day.

P.L.IER.

(92i) In the body cavity of a cricket (*Gymnogryllus erythrocephalus*) at Aligarh, U.P., India, third-stage larvae of a physalopterid species, probably of the genus *Thubunaea*, occurred in large numbers. These are described and illustrated. In cephalic structure, position of vulva and of cervical papillae these larvae are similar to *T. impar* but a definitive diagnosis is not practicable. Basir draws attention to the absence of any description of the vestibule in the only species of *Physalopteroides* Wu & Liu, 1940, namely *P. dryophis*; if one were present it would render the status of this genus doubtful.

R.T.L.

(92j) Morphological variations in *Andrya macrocephala* are such that the distribution and number of testes and the size of the ventral longitudinal excretory canal are *per se* of no value in the differentiation of the North American species of *Andrya*, but the average egg diameter is apparently a reliable character especially in combination with these characters. *A. microti*, *A. ondatrae* and probably *A. caucasica* are synonyms of *A. macrocephala*. A number of new host and distribution records are listed for the four North American species of *Andrya*, namely *A. primordialis*, *A. macrocephala*, *A. neotomae* and *A. sciuri*.

R.T.L.

(92k) After experimental cutaneous infection of nine calves with *Bunostomum phlebotomum*, eggs first appeared in the faeces between the 52nd and 68th day, while acute symptoms, loss of weight and one death occurred between the 30th and 60th day after infection. The egg counts of those calves which showed the severest symptoms were negative or relatively low, whereas in those which exhibited less severe or no symptoms the egg counts were high. This suggests that in a herd those calves showing the least symptoms may be the greatest source of larvae and may give rise to new epidemics. Moreover, after the larvae have reached adult stage and begun to produce eggs the animals begin to improve in general condition and increase steadily in weight, as in cases infected with the stomach worm and nodular worm. It follows that the general improvement in condition as a consequence of the usual treatment is due to progressive recovery from symptoms due to the larvae and not to the removal of adults.

R.T.L.

(92l) *Levinseniella charadriiformis* n.sp. is described from the willet and godwit, Californian shore birds. The cirrus and the pockets in the genital atrium are unarmed. The suckers are also naked and are much smaller than in other species except *L. minuta*, which is distinguished by its small size. A *Spelotrema* very similar to *S. nicolli* and *S. pygmaeum* (if these are distinct species) developed in a stone curlew (*Burhinus* sp.) fed experimentally on sand crabs (*Emerita analoga*).

R.T.L.

(92m) Two instances are given of prenatal infection of puppies with *Toxocara canis* and *Ancylostoma caninum* in which it appears possible that the infections of the bitches which gave rise to the parasitism of the puppies had been acquired prior to the commencement of gestation. It is suggested that many of the infective larvae in the bitches had been temporarily immobilized in their somatic tissues by the resistance of the host, but owing to the debilitating effects of pregnancy these larvae became activated and passed through the maternal circulation to the fetuses.

R.T.L.

(92n) *Olssoniella chivosca* n.sp. is described from the bile duct of *Hesperiphona vespertina brooksi* in Oregon, U.S.A. It differs from *O. stunkardi* and *O. rara* in the size of its yolk glands, which converge anteriorly and posteriorly and are larger and overlapping. The body cuticle is smooth. The ventral sucker is wider than the body. R.T.L.

(92o) A list of chemicals which proved lethal to cercariae of *Schistosoma mansoni* is tabulated. Seventeen killed the cercariae within three minutes; most of them were quinones and tertiary amines which are potent enzyme inhibitors and act in concentrations of 0.01% or less. Aqueous extracts of dried leaves, fruit and bark of *Balanites aegyptiaca* proved less active than the extracts of fresh fruit reported by Archibald (1933). R.T.L.

(92p) The characters of the larvae and pupae of *Mansonia xanthogaster* are described. No fully developed infective larvae of *Wuchereria malayi* were found in *M. xanthogaster* or other mosquitoes in the Solomons or New Hebrides. It appears that *W. malayi* exists as a non-transferable parasite in Tonkinese imported as labourers in the plantations of these South Pacific islands. R.T.L.

(92q) Tetrathyridium larvae of *Mesocoestoides* sp. in numbers ranging from one to 1,000 occur in the peritoneal cavity of *Rattus rattus* in Cyprus. 12% of 310 spiny mice (*Acomys dimidiatus*) examined were also infected; as these live away from villages, their infections are probably derived from foxes. *M. lineatus* is a common tapeworm in dogs and occurs in the local foxes. R.T.L.

(92r) A detailed account is given of *Apororhynchus amphistomi* n.sp. from the warblers *Wilsonia canadensis* and *Compsothlypis americana* from Virginia and Georgia. Certain basic morphological characters in this member of the Apororhynchidae stand in bold contrast to all other Acanthocephala and place this family in the Metacanthocephala, but prohibit its assignment to any of the existing orders. A new order Sphenacanthocephala is therefore created for its reception. R.T.L.

(92s) Ciordia has found that the chromosome number for *Rhopalias macracanthus* is eight haploid, sixteen diploid. This is within the range found by Britt in 35 digenetic trematodes and indicates that aneuploidy may have played a part in speciation of these trematodes. R.T.L.

(92t) The third case of ocular gnathostomiasis in man is now recorded. The patient was a native of Canton. The worm which was extracted from the iris was an immature specimen, 2.54 mm. long. It was tentatively assigned to *Gnathostoma hispidum* on the nature of the cephalic hooks and the extent of the body spines. R.T.L.

(92u) Attempts to produce experimentally *in utero* infection of mice with *Schistosoma mansoni* by percutaneous exposure of pregnant females to 100-200 cercariae were unsuccessful, although the parent mice all acquired an average of 25 worms each. R.T.L.

93—Journal of Pharmacology and Experimental Therapeutics.

- a. PETERS, L., BUEDING, E., VALK, Jr., A. D., HIGASHI, A. & WELCH, A. D., 1949.—
"The antifilarial action of cyanine dyes. I. The relative antifilarial activity of a series of cyanine dyes against *Litomosoides carinii*, *in vitro* and in the cotton rat." 95 (2), 212-239.

(93a) An account is given of a series of comparative studies on the antifilarial activity *in vitro* and *in vivo* of a large number of cyanine dyes against *Litomosoides carinii*. Many different types of cyanines were found to possess antifilarial activity. The compound Chemotherapy Center No. 348 produced complete cures in the cotton-rat when given intraperitoneally once daily for three days. A cure could be obtained by a single dose which approached the lethal dose. This compound inhibited the oxidative metabolism of adult *L. carinii* in the dilution 1 in 40 million. Eleven related compounds are being studied further for selection for clinical trial in cases of *Wuchereria bancrofti*. R.T.L.

94—Journal of the Royal Egyptian Medical Association.

- a. HALAWANI, A., HAFEZ, A., NEWSOME, J. & COWPER, S. G., 1949.—“Miracil D: effect on *B. mansoni* in vitro and in the treatment of urinary bilharziasis.” 32 (1), 29–51.
- b. NOR EL DIN, G. & BAZ, I. I., 1949.—“Treatment of cestodes with chloroquine as compared with other known vermifuges.” 32 (1), 52–61.

(94a) *In vitro* testing of drugs on *Schistosoma mansoni* adults kept alive in Tyrode-serum medium yielded a rough figure of the lethal concentration of the drug in the blood of infected persons. Such *in vitro* tests with Miracil-D showed that not less than 5 μ gm. per ml. with an action period of four days was necessary. Clinical tests were made on infected persons with a history of haematuria for six months or more. Miracil given by the mouth as a powder and in cachets gave rise to irritation in the mouth, oesophagus and stomach causing severe anorexia, nausea with depression and, occasionally, vomiting, pain in the chest, colic with constipation, giddiness and yellow staining of the skin. Some had hysterical symptoms. All recovered from these symptoms on the 4th or 5th day. There were no toxic effects on the heart, kidney, liver or blood. Two months after treatment 18 out of 20 patients relapsed. After six months two patients were still free from eggs containing living miracidia. It is concluded that the severity of the effects on the alimentary tract militates against the routine use of Miracil-D. R.T.L.

(94b) Chloroquine, two tablets daily for two weeks, was tested against *Hymenolepis nana* in 37 patients, mainly children aged 7–12 years. Of 25 cases followed for six months 18 remained free of tapeworm during the whole period, 4 remained negative for three months and only three showed eggs in the stool without interruption. Dosing was usually followed by a saline purge which might, however, aggravate the toxic symptoms occasionally produced, namely drowsiness, marked photophobia, vertigo, incoordination and ataxia, nausea and vomiting, diplopia and myasthenia, all of short duration. Parenteral injection of prostigmine prevented or relieved the myasthenic condition and had the additional advantage of stimulating peristalsis and thus assisting the expulsion of the worms. E.M.S.

95—Journal of the Royal Faculty of Medicine of Iraq.

- *a. WATSON, J. M. & AL HAMAMI, A., 1949.—“Studies on bilharziasis in Iraq. Part II. Incidence in the city of Baghdad—an analysis of over a thousand random urine samples with reference to age, sex and locality.” 13, 49–62.

(95a) The incidence of urinary bilharzial infection in the lower income groups of the population in Baghdad approximates 27% in males and 14% in females. The infection is endemic in the city. The peak period of incidence lies between the ages of 20 and 30 as shown in an analysis of 1,000 random samples of urine. R.T.L.

96—Journal of the Tennessee Academy of Science.

- a. GOODMAN, J. D., 1949.—“Observations on the anatomy, classification, and life history of the trematode genus *Stomatrema* Guberlet (1928).” 24 (1), 52–59.

(96a) Goodman has been unable to confirm the presence in *Stomatrema pusilla* of the large sac-shaped receptaculum seminis mentioned by Guberlet, or of a thick spination on the surface of the body which previous workers have described in this genus. In his material spines were absent from the dorsal surface but the ventral surface was uniformly spined. He agrees with Mehra in assigning *Stomatrema* to the subfamily Reniferinae and gives an emended diagnosis of this genus based on studies of *S. pusilla* and *S. faranciae*. A metacercaria of the *Lechriorchis* type, which was found encysted in the buccal mucosa of *Amphiuma means tridactylum*, is believed to be a larval stage in the life-cycle of *Stomatrema*. R.T.L.

97—Lancet.

- a. BLAIR, D. M., LOVERIDGE, F. G., MEESER, C. V. & ROSS, W. F., 1949.—“Urinary schistosomiasis treated with miracil D.” Year 1949, 1 (6548), 344–346.
- b. RAIL, G. A., 1949.—“Intensive treatment of schistosomiasis with sodium antimonytartrate.” [Correspondence.] Year 1949, 1 (6552), 548.
- c. BARRETT, N. R., 1949.—“Removal of simple univesicular pulmonary hydatid cyst.” Year 1949, 2 (6571), 234.

(97a) Ninety per cent of 82 African children with urinary *Schistosoma haematobium* infections were cured by miracil-D provided a total dosage of at least 60 mg. per kg. body-weight spread over 3–6 days was taken. None of the cured cases relapsed. No toxic symptoms resulted in about half of the patients. The same dosage gave poor results in *S. mansoni* infections. At present the average cost is about eight shillings per case. R.T.L.

(97b) Of 20 cases of schistosomiasis treated by Rail with a 30-hour course of sodium antimonyl tartrate, 17 had slight headache, lassitude and inertia but only in two of these were the reactions severe. Clinical records of three of the cases are given. No eggs were found in the stools or urine six months after completion of treatment. The results generally were in harmony with those obtained by Alves & Blair [see Helm. Abs., 15, No. 40a]. R.T.L.

98—Maandblad voor de Landbouwvoorlichtingsdienst.

- a. FLIK, H. M. & SAALTINK, G. J., 1949.—“Ziekten en beschadigingen bij landbouwgewassen in 1948.” 6 (3/4), 96–107.
- b. OOSTENBRINK, M., 1949.—“Enkele algemene beschouwingen over de *Heterodera*-ziekten in de landbouw.” 6 (3/4), 164–166.

(98a) In a section on clover (p. 107) Flik & Saaltink report the finding in 1947, for the first time in Holland, of eelworm cysts on the roots of a number of clover plants. A further examination of the fields in 1948 showed *Heterodera schachtii* var. *trifolii* to be rather common, and in individual cases there was fairly serious damage. M.T.F.

(98b) Pointing out that eelworm diseases are essentially the result of unbalanced cropping methods favouring one crop too frequently, Oostenbrink goes on briefly to mention the various species of *Heterodera* and concludes that the threat of disease gives a strong case for adopting crop rotations as extended as possible. B.G.P.

99—Mededelingen van de Landbouwhogeschool en de Opzoekingsstations van de Staat te Gent.

- a. BRANDE, J. VAN DEN & DAMME, J. VAN, 1949.—“Bestrijding van het roggeaaltje (*Ditylenchus dipsaci* Kühn).” 14 (2), 135–144. [English, French & German summaries p. 141.]

(99a) Against *Ditylenchus* [= *Anguillulina*] *dipsaci* in rye, van den Brande and van Damme have tested D-D mixture injected 12 and 20 cm. deep at rates of 0, 2, 3, 4 and 6 litres per are [2 litres per are = 17.8 gal. per acre] in duplicate plots. Injection points were 30 cm. apart for the 2-litre rate and 40 cm. for the others. Plots were injected in September at about 14°C. Treated plots showed a response proportional to dosage in stand, tillering, and yield, and the percentages of eelworm-infested plants in May, at 0, 2, 3, 4 and 6 litres per are, were respectively 72, 13, 11, 7 and 2. The deeper injection was consistently better. In spite of 4½-fold increased yield at the highest rate, only the lowest rate (with a 3-fold increase) is economically practicable. B.G.P.

100—Medical Journal of Malaya.

- a. WALKINGSHAW, R., 1949.—“A subcutaneous migrating embryo.” 3 (4), 264.

(100a) An immature *Gnathostoma spinigerum* was removed from a swelling resembling a simple paronychia at the root of the nail of the right forefinger of a Chinese woman in Malaya. R.T.L.

101—*Natura Jutlandica*.

- a. OVERGAARD NIELSEN, C., 1949.—"Studies on the soil microfauna. II. The soil inhabiting nematodes." 2, pp. 1-131. [Reprint.]

(101a) In this important paper Overgaard Nielsen presents information on the biology and ecology of free-living nematodes with a view to estimating their qualitative and quantitative share in the biological processes taking place in the soil. The work is divided into a number of chapters and contains many tables and graphs. Methods used in the collection of the nematodes are described and an account is given of the wide range of soil types, natural and cultivated, which have been sampled. The general and vertical distribution of the many forms encountered is dealt with, as is also the distribution in relation to the moisture content of the various soils. Numbers of nematodes per square metre were estimated, their weight was also calculated, and a figure arrived at for their oxygen consumption. The nutrition of free-living nematodes is fully discussed and they are placed in four principal groups: (i) those which suck plant roots and possibly fungal hyphae; (ii) those which possibly feed on soil algae; (iii) those which feed on particulate material, chiefly bacteria; (iv) those which are predatory on nematodes and other lowly animal organisms. The importance of nematodes is discussed in relation to other organisms such as protozoa, in connection with the nitrogen cycle of the soil and, in regard to those forms which feed on soil bacteria, it is suggested that the soil nematodes have about one-tenth the importance of the soil protozoa.

T.G.

102—*Nature*. London.

- a. GOTO, H. E. & HEWER, H. R., 1949.—"Occurrence of *Acanthocephalus ranae* Schrank in Great Britain." [Correspondence.] 163 (4146), 610-611.
 b. ROTH, H., 1949.—"Trichinosis in Arctic animals." [Correspondence.] 163 (4151), 805-806.
 c. ROGERS, W. P., 1949.—"Aerobic metabolism in nematode parasites of the alimentary tract." [Correspondence.] 163 (4153), 879-880.
 d. KENDALL, S. B., 1949.—"*Lymnaea stagnalis* as an intermediate host of *Fasciola hepatica*." [Correspondence.] 163 (4155), 880-881.
 e. LEIPER, J. W. G., 1949.—"Continuous sedimentation for the concentration of trematode eggs in faecal suspensions." [Correspondence.] 163 (4154), 908.
 f. MASSEY, V. & ROGERS, W. P., 1949.—"The tricarboxylic acid cycle in nematode parasites." [Correspondence.] 163 (4154), 909.
 g. NOBLE, M., 1949.—"Stem eelworm in strawberries." [Correspondence.] 164 (4157), 31-32.

(102a) Goto & Hewer record the finding of numbers of *Echinorhynchus* [syn. *Acanthocephalus*] *ranae* in *Rana t. temporaria* collected at Norwich and in *Bufo b. bufo* collected at Amersham. Measurements of ten of these specimens are tabulated and it is noted that the *Bufo* specimens are unusually small. In several hundred *R. temporaria* examined previously from unrecorded localities, only one specimen was found. The distribution is probably very local.

E.M.S.

(102b) Over 300 cases of trichinelliasis with 33 deaths occurred among the native population of the coast of north-western Greenland, particularly around Disko Bay, in the spring of 1947. Most of the cases were apparently acquired from infected walrus meat. Examination of 133 walruses proved negative, but positive evidence of trichina infection was found in one out of 28 bearded seals (*Erignathus barbatus*), 46 out of 66 sledge dogs, 6 out of 19 polar bears and 3 out of 101 Arctic foxes (*Alopex lagopus*). [Earlier results published by Thorborg, Tulinius & Roth (for abstract see Helm. Abs., 17, No. 142a) are included in these figures.]

R.T.L.

(102c) The oxygen tension in the intact small intestine in the rat, and in the small intestine and abomasum in the sheep, was determined under anaesthesia. The oxygen consumption of *Nippostrongylus muris*, *Nematodirus* spp. and *Haemonchus contortus* was found to vary with the oxygen tensions in their respective habitats. It is concluded that aerobic mechanisms play an important part in the metabolism of small nematodes of the alimentary tract, particularly in the case of *Nippostrongylus muris* and *Nematodirus* spp. The work is to be published in greater detail elsewhere.

E.M.S.

(102d) Freshly hatched laboratory-reared *Limnaea stagnalis* were exposed to massive infestation by *Fasciola hepatica* miracidia. Of 101 snails subsequently examined, 13 were found to be infected; ten of these were dissected before cercariae appeared and two died soon after cercariae were first shed. The remaining snail shed 99 perfect cercariae, 86 within a 24-hour period 113 days after infection. Four of these cercariae were pipetted into the mouth of a rabbit, from whose bile ducts a half-grown *F. hepatica* was recovered six weeks later. Adult *L. stagnalis* could not be infected. Partial development in young *L. pereger* and *L. palustris* has been observed. E.M.S.

(102e) As certain techniques for concentrating nematode eggs are inapplicable to those of trematodes owing to the collapse of the shell, J. W. G. Leiper describes and illustrates a simple apparatus with which, by continuous sedimentation, the debris and colouring matter in sheep faeces is reduced to less than half with the loss of very few eggs of *Fasciola hepatica* and *Paramphistomum cervi*. The specific gravity of nematode eggs is too near that of water for the apparatus to be used successfully for these eggs. R.T.L.

(102f) Some aspects of the oxidative utilization of pyruvate have been studied in *Ascaridia galli*, *Nematodirus spathiger*, *N. filicollis* and *Neoapectana glaseri*. Using breath prepared from whole parasites suspended in Krebs-Ringer phosphate buffer at pH 7.3, the oxygen consumption at 38°C. (Warburg "direct" method) varied somewhat with different lots of parasites, but Q_{O_2} values were usually about 3.8 (*Nematodirus*), 4.0 (*Neoapectana*) or 4.2 (*Ascaridia*). Oxygen uptake was increased by the substrates pyruvate, malate, α -ketoglutarate, fumarate and succinate, in order of increasing activity. This suggests that some form of Krebs tricarboxylic acid cycle was functioning in the parasite tissues. However, compared to pigeon breast muscle the parasite tissue was relatively insensitive to malonate and furthermore, malonate inhibition was usually increased in the presence of added succinate. Pyruvate, fumarate and malate all markedly reduced the inhibition caused by malonate. E.M.S.

(102g) *Anguillulina dipsaci* caused crumpling and malformation of the leaves of strawberry plants in land in Scotland previously planted with beans for three seasons and cauliflower for one season. Similar plants in another field were not affected, and it is assumed the infection came from the soil, which had become heavily infested by the three successive bean crops. J. B. Goodey transferred the infection from the strawberries to oats, the strain attacking both beans and oats. E.M.S.

103—North American Veterinarian.

- a. BLAIR, H. E., 1949.—"Vermiplex, a new anthelmintic for dogs." 30 (5), 306-309.
- b. BRUNER, D. W., 1949.—"Anthelmintic treatment of pregnant mares." [Questions & Answers.] 30 (5), 319.
- c. FRICK, E. J., 1949.—"Teniocides and pulicides for cats." [Questions & Answers.] 30 (6), 390-391.

(103a) A combination of methylbenzene which has an anthelmintic action on roundworms and di-phenthane-70 which is a recognized taeniocide, to which the name "Vermiplex" is given, is shown to be highly efficacious in dogs. 95% of ascarids were removed from 21 dogs, 82% of hookworms from 27 dogs, 85% of *Dipylidium caninum* from 61 dogs, and 72% of *Taenia* from 46 dogs. The therapeutic dose recommended is 0.1 gm. of methylbenzene and 0.1 gm. of di-phenthane-70 per lb. body-weight, given in elastic gelatin capsules. R.T.L.

(103b) It is recommended that no anthelmintic treatment should be given to mares during the last 30 days of gestation. R.T.L.

104—Pacific Science. Honolulu.

- a. LINFORD, M. B., OLIVEIRA, J. M. & ISHII, M., 1949.—“*Paratylenchus minutus*, n.sp., a nematode parasitic on roots.” 3 (2), 111-119.

(104a) Linford et al. describe and figure a new species of *Paratylenchus*, *P. minutus* n.sp., which occurs very abundantly about the roots of pineapple in certain old fields on the island of Oahu, Hawaii. It probably lives ectoparasitically on root hairs and epidermis, not only of pineapple but of 24 other plants, and is considered by the authors to be non-pathogenic.

T.G.

105—Phytopathology.

- †a. CHRISTIE, J. R., 1949.—“The nature of resistance in plants to root-knot.” 39 (6), 495.
 †b. MACHMER, J. H., 1949.—“Soil fumigation for the control of the root-knot nematode in peach, fig, and grape plantings.” 39 (6), 498.
 †c. ROSEN, H. R., 1949.—“Types of nematode injury on small-grain seedlings.” 39 (6), 499.
 †d. SMITH, A. L., 1949.—“Soil fumigants for controlling Fusarium wilt and nematodes of cotton.” 39 (6), 499.
 e. CHITWOOD, B. G., 1949.—“Host-parasite interrelationships of nematodes in root diseases.” [Abstract of paper presented at the 6th Annual Meeting of the Potomac Division, American Phytopathological Society, Beltsville, Md., February 23 and 24, 1949.] 39 (6), 502.
 f. TARJAN, A. C., 1949.—“Studies on selenium therapy of meadow nematode-infected boxwood.” [Abstract of paper presented at the 6th Annual Meeting of the Potomac Division, American Phytopathological Society, Beltsville, Md., February 23 and 24, 1949.] 39 (6), 505.
 g. McCLELLAN, W. D. & CHRISTIE, J. R., 1949.—“Incidence of Fusarium infection as affected by root-knot nematodes.” 39 (7), 568-571.
 h. CLAYTON, C. N. & ELLIS, D. E., 1949.—“Soil treatments with chloropicrin, D-D, and uramon for control of the root-knot nematode.” 39 (7), 583-589.
 i. ELLIS, D. E., CLAYTON, C. N. & OWENS, R. G., 1949.—“Effects of soil treatments with uramon and certain fumigants upon plant growth and incidence of root-knot.” 39 (7), 590-597.

(105a) In considering the nature of the resistance shown by some plants to parasitization by *Heterodera marioni*, Christie shows that in susceptible host plants galls are formed within which the giant cells provide a continuous source of nourishment for the parasite. In resistant plants, on the other hand, although the roots become invaded by larvae of the parasite, the necessary changes in the plant tissues fail to take place and the nematodes die of starvation.

T.G.

(105b) Machmer found that the injection of 78 c.c. of chloropicrin, at each site where an Elberta peach tree was subsequently planted in 1944, led to an increase in trunk diameter, volume occupied by foliage, and aggregate yield over five seasons. The use of cover crops resistant to root-knot had similar effects in comparison with susceptible cover crops, but the chloropicrin effects were greater. Subsoil fumigation gave greater tree vigour than fumigating larger shallow areas. Figs and grapes gave similar results.

B.G.P.

(105c) Rosen shows that in Arkansas the roots of oats, wheat, barley and rye when sown as autumn crops may show signs of nematode injury, particularly in dry seasons. One type of injury is the presence of small terminal swellings due to *Heterodera marioni* on seminal roots. The other type of injury is localized rotting of seminal roots, often of the subcoronal internode, with yellowing of leaves. In this second type of injury the author reports that Steiner has found species of *Aphelenchoides* and *Paraphelenchus* as well as a number of other nematodes, but no meadow nematodes.

T.G.

(105d) Smith compared D-D mixture and ethylene dibromide (23%, W/W) at 3.5, 7 and 14 gal. per acre for controlling Fusarium wilt and eelworms in cotton. D-D at the lowest rate gave the most economical yield increases; at the highest rate it caused abnormal plant growth, probably through nitrogen stimulation. At all rates with simultaneous injection and planting it reduced plant emergence, whereas ethylene dibromide did not.

B.G.P.

† Abstract of paper presented at the 1949 Annual Meeting of the Southern Division, American Phytopathological Society, Baton Rouge, Louisiana, January 31 to February 2, 1949.

(105e) Generalizing on the host-parasite relationships of root-parasitic eelworms, Chitwood lists ten variable factors, a change in any one of which may alter the whole situation. B.G.P.

(105f) Tarjan shows that when adult meadow nematodes (*Pratylenchus pratensis*) were immersed in solutions of sodium selenate of 5 to 1,000 p.p.m. they were not apparently adversely affected. When, however, solutions of 25, 50 and 100 p.p.m. were applied to soil around the roots of 12-years-old boxwood plants, striking fluctuations in the root nematode populations occurred in contrast to the control plants. Boxwood plants 13 years old were also treated with 50 and 75 p.p.m. Over a period of five months, counts of nematodes from root samples of treated plants were lower than the controls at the 1% level of significance. T.G.

(105g) McClellan & Christie report on experiments to test the statements that severity of Fusarium wilt is increased by *Heterodera marioni*. There is indirect evidence that when soil fumigants are used to control nematodes there is a reduction in severity of cotton wilt. They conclude that under the conditions of their experiments *H. marioni* has little effect on the Fusarium infection, neither were any conclusions to be drawn about the different *H. marioni* populations used. J.B.G.

(105h) Sandy loam infected with *Heterodera marioni* was treated by the application of chloropicrin at 400 lb., D-D at 200, 400 and 600 lb., and Uramon (urea) at 2,420 and 4,840 lb. per acre 7, 10 and 14 months prior to planting snap beans and tomatoes. Prior treatment at 7 and 10 months was more effective in reducing root-knot than at 14 months, when the higher rates of application of both Uramon and D-D gave better control than the lower. Although root-knot control on both crops was similar, only tomatoes showed better growth and higher yield; beans seemed more susceptible to the phytotoxicity of the chemicals. Water sealing after treatment had little effect. The general effects on control of root-knot and on plant yield were carried over to some extent into the second year. J.B.G.

(105i) Eradication of *Heterodera marioni* was not achieved by annual applications for three successive years of chloropicrin at about 400 lb., D-D at about 300 lb., ethylene dibromide at about 220 lb. and ethylene chlorobromide at about 400 lb. per acre, although there was no noticeable cumulative phytotoxicity. Uramon (urea) applied at as little as $\frac{1}{4}$ lb. per sq. yard in autumn resulted in increased growth and yield of plants growing in sandy soil heavily infested with root-knot. The toxic effects of Uramon were largely offset by the addition of organic material to the soil. Snap beans were uninjured by applications of ethylene dibromide at 200, 400 and 600 lb. per acre in autumn or spring, of D-D and of chloropicrin at 200 and 400 lb. per acre in autumn, and of chloropicrin at 200 lb. per acre in spring. However, chloropicrin and D-D applied at 400 and 600 lb. per acre in spring or at 600 lb. per acre in autumn reduced growth and yield of snap beans. J.B.G.

106—Post Graduate Medical Journal.

a. JENKINS, J. A., 1949.—"Hydatid disease." 25 (281), 107-124.

b. PHILLIPS, W., 1949.—"Surgical treatment of hydatid disease of the lung." 25 (281), 125-135.

(106a) The rate of growth of the hydatid cyst varies enormously. The most rapid growth occurs in the liver of young children. The vascular supply of the host tissues is of paramount importance. Density and fixity of surrounding structures may check the rate of growth and the liability to complications. Illustrative cases seen in New Zealand are briefly described and their appropriate treatment outlined. R.T.L.

107—Poultry Science.

- a. BUSHNELL, L. D. & ERWIN, L. E., 1949.—“The antitryptic action of *Ascaridia galli*.” 28 (1), 8-9.
- b. TODD, A. C. & CULTON, T. G., 1949.—“On naturally acquired helminth infections in hybrid and standard-bred chickens.” 28 (1), 84-86.

(107a) A physiological saline extract of freshly ground living *Ascaridia galli* prevented the digestion of casein in the presence of 20 times the concentration of trypsin necessary for complete digestion, as compared with controls in which trypsin alone was used. This antitryptic action was of the same order as that of chicken blood serum. R.T.L.

(107b) When 43 New Hampshire and 49 Hy-Line Hybrid chickens were reared together, greater development of *Hymenolepis carioca* was found in the hybrids and of *Raillietina cesticillus* in the New Hampshires. The differences in numbers of tapeworms naturally acquired were found to approach statistical significance at the 5% level and are ascribed, in part, to the level of thyroid activity in these two hosts. R.T.L.

108—Proceedings of the Royal Society. Series B.

- a. DAVENPORT, H. E., 1949.—“The haemoglobins of *Ascaris lumbricoides*.” 136 (883), 255-270.
- b. DAVENPORT, H. E., 1949.—“The haemoglobins of *Nippostrongylus muris* (Yokogawa) and *Strongylus* spp.” 136 (883), 271-280.
- c. DAVENPORT, H. E., 1949.—“*Ascaris* haemoglobin as an indicator of the oxygen produced by isolated chloroplasts.” 136 (883), 281-290.

(108a) Davenport has examined the haemoglobins from the perienteric fluid and body wall of *Ascaris lumbricoides* (pig strain). Spectroscopically, the oxyhaemoglobins of the parasite differed from those of mammalian blood in that the β -band was greater than the α -band; the parasite alkaline methaemoglobins, which had a pK of 7.4, also showed spectra which differed considerably from those prepared from mammalian blood. The affinity of *Ascaris* haemoglobins for oxygen was extremely high and the time (t_{50}) for half-dissociation of oxygen from the oxyhaemoglobin of perienteric fluid was remarkably long, 150 seconds at pH 6, 20.5°C. The temperature coefficient of the reaction was 5, and the velocity increased with changes in pH from 5 to 9. The t_{50} of body wall oxyhaemoglobin was 80 seconds at pH 6, 3°C. Both dissociation reactions were unimolecular and independent of the concentration of reducing agent (sodium dithionite). The t_{50} 's of the formation of the methaemoglobins from the *Ascaris* oxyhaemoglobins in the presence of potassium ferricyanide *in vacuo* were similar to those of the deoxygenation reactions; beyond half-completion, however, the reactions were no longer unimolecular. Though the velocity was independent of ferricyanide concentration, a back-reaction with oxygen was observed. Compared with oxygen, carbon monoxide had a low affinity for the parasite haemoglobins. The “span”, i.e. the distance between the α -bands of the oxyhaemoglobins and the carboxyhaemoglobins, was 90-95Å for both the *Ascaris* pigments. Under anaerobic conditions the body wall oxyhaemoglobin of living *Ascaris* was deoxygenated; the perienteric fluid pigment was unaffected. W.P.R.

(108b) Davenport has shown that *Nippostrongylus muris* contains oxyhaemoglobin with an α -band at 5777Å and a β -band at 5405Å. At pH 9.2, 19°C. and a haemoglobin concentration equivalent to 0.6×10^{-4} M haematin, the oxyhaemoglobin was half-saturated at an oxygen tension of about 0.1 mm. of mercury. *Strongylus* spp. oxyhaemoglobin resembled that of the perienteric fluid of *Ascaris lumbricoides* in its high affinity for oxygen and in its spectroscopic properties. The physiological function of haemoglobins in nematode parasites is discussed. W.P.R.

(108c) Davenport has used the haemoglobins of *Ascaris lumbricoides* as indicators of oxygen produced by isolated chloroplasts. The parasite pigments are, by virtue of their very high affinity for oxygen, peculiarly suited for this purpose. W.P.R.

109—Proceedings of the Society for Experimental Biology and Medicine.

- a. STEIN, K. F., 1949.—“Effect of cortical extract and other agents on eosinophilia of mice infected with *Trichinella spiralis*.” 71 (2), 225–226.

(109a) As mice forcibly fed with trichinosed meat exhibit an eosinophilia which remains constant for several weeks, they were used as tests for haematologic assay of adrenocortical activity. The number of eosinophiles was decidedly reduced by cortical hormone and also by epinephrine [adrenalin] in intact, but not in adrenalectomized, trichinous mice. Urethane induced eosinopenia. R.T.L.

110—Public Health Reports. Washington.

- a. KOHLER, C. E., 1949.—“Filariasis control by DDT residual house spraying, Saint Croix, Virgin Islands. I. Operational aspects.” 64 (27), 857–862.
b. BROWN, H. W. & WILLIAMS, R. W., 1949.—“Filariasis control by DDT residual house spraying, St. Croix, Virgin Islands. II. Results.” 64 (27), 863–875.

(110a) In Saint Croix, Virgin Islands, where 13.3% of the schoolchildren had microfilariae of *Wuchereria bancrofti*, the majority of domestic mosquito breeding on the island occurs in water stored around houses. A D.D.T. residual spraying programme of all premises was carried out between 1946 and 1948. This paper deals solely with methods, procedures and costs. After two years this programme was abandoned in favour of an attempt to control filariasis by treatment of every individual on the island. R.T.L.

(110b) The D.D.T. residual spraying programme of houses and schools carried out from 1946 to 1948 in St. Croix reduced the population of *Culex quinquefasciatus* by 50% in the houses. *Aedes aegypti* was completely eliminated from the houses. The number of *C. quinquefasciatus* in which *Wuchereria bancrofti* larvae had developed beyond exsheathing of the microfilariae was reduced by 50%. Before spraying commenced 0.4% of all *C. quinquefasciatus* examined harboured infective larvae. After the completion of the programme no infective-stage larvae were found. R.T.L.

111—Report of the Imperial Veterinary Research Institute, Mukteswar and Izatnagar.

- a. ANON., 1949.—“Veterinary zoology. IV. Helminthology.” Year 1941–42, pp. 43–45.

(111a) Failure to find *Fasciola cercariae* in the molluscan intermediaries in certain localities in the North-West Frontier Province of India during August and September, although these were very common during the same months in the molluscs of hill streams at Almora, suggests that the cercariae mature at a different time in the plains and in the hills. *Cercaria Indica* II, X, XII, XXV, XXVI, XXX and XXXV were found in molluscs in Hyderabad State. *Indoplanorbis exustus* harboured *C. Indica* XVII and XXXV but in none were *Fasciola cercariae* present. The cocoons of *Limnaea* sp. were infected with *C. Indica* XXX. Goats fed with *C. Indica* XXVI proved negative. Sheep but not goats were experimentally infected with *Mecistocirrus digitatus*. Carbon tetrachloride and nicotine gave satisfactory results against strongyles in sheep only when administered immediately after a dose of copper sulphate. Several species of cercariae found in the Bori Tank, including three new forms, are mentioned but not described. *Azygia angusticauda* and a *Gnathostoma* larva were collected from the fish *Mastacembelus pancalus*. *Trichocephalus leporis* from a hare is now recorded from India. R.T.L.

112—Revista de Agricultura. São Paulo.

- a. BOOCK, O. J., 1949.—“O fumigante ‘Dowfume W-10’ no controle aos nematóides da batatinha.” 24 (1/2), 25–42. [English summary p. 42.]

(112a) *Heterodera marioni* on potatoes lowers the commercial value and keeping qualities of the galled tubers. Boock has injected 10% ethylene dibromide (in naphtha) at 30 gallons per acre, 12–15 cm. deep at points 20 cm. and 40 cm. apart, in both summer

and winter, planting potatoes 0, 1 and 2 weeks after injection, with and without added fertilizer and testing four potato varieties. Infestations were higher in the hot wet season, and the injections were more effective at 20 cm. apart, giving a 60% reduction in the proportion of infested plants. To avoid phytotoxic effects potatoes must be planted not less than one week after injection. Fertilizers had no effect on infestation. The variety "Bintje" was significantly less susceptible than "Eigenheimer". Land should not have been recently cultivated before injection or the gas will escape too readily. B.G.P.

113—Revista de la Asociación Médica Argentina.

- a. DIEZ, J. & COTTINI, G. F., 1949.—"Quiste hidatídico primitivo del diafragma. Frenoquistectomía." 63 (645/646), 29-31.

114—Revista Ibérica de Parasitología.

- a. REYES PUGNAIRE, M. DE, 1949.—"Contribución al tratamiento quirúrgico de las elefantiasis, con algunas consideraciones generales sobre las mismas y en particular sobre las presentes en los territorios españoles del Golfo de Guinea." 9 (1), 3-85. [English summary pp. 150-151.]
- b. YBARRA, G. A., 1949.—"Una nueva especie de filaria de las aves de México." 9 (1), 87-90. [English summary p. 151.]
- c. LÓPEZ-NEYRA, C. R. & GONZÁLEZ CASTRO, J., 1949.—"Ensayos previos sobre acción antibacteriana de algunos helmintos." 9 (1), 109-146. [English summary pp. 141-142.]
- d. GONZÁLEZ DE VEGA, N., GÓMEZ-MORENO VILLAR, C. & PARDO LÓPEZ, L., 1949.—"Discusión sobre un caso de pentastomiasis pulmonar humana, con revisión de las parasitosis pulmonares del hombre." 9 (2), 167-206. [English summary p. 204.]
- e. CABALLERO Y CABALLERO, E., 1949.—"Presencia de *Neochetosoma crotali* (Self, 1945) n.comb., en las 'nauyacas' de México." 9 (2), 207-211. [English summary p. 204.]
- f. TARAZONA VILAS, J. M., 1949.—"Hallazgo del macho y de la hembra del *Trichonema parvibursatum* (Vaz, 1934) en España." 9 (2), 259-261. [English summary p. 205.]
- g. LÓPEZ-NEYRA, C. R. & GONZÁLEZ CASTRO, J., 1949.—"Acción antibacteriana del jugo y triturados desecados de *Moniezia expansa* (Rudolphi 1810) frente al bacilo de Eberth." 9 (3), 279-297. [English summary pp. 296-297.]
- h. LOPEZ-NEYRA, C. R., 1949.—"Raillietinosis humanas. Estudios de parasitología comparada sobre Raillietiniinae parásita humanas y en especial de las formas neotropicales." 9 (3), 299-362. [English summary pp. 348-351.]

(114a) Elephantiasis is common in the Spanish territories of the Gulf of Guinea. Aetiologically it is not the classic form caused by *Wuchereria bancrofti* but is more like the form seen in the Belgian Congo, in which *Onchocerca volvulus* and *Dipetalonema streptocerca* may be involved. Treatment is described in detail. E.M.S.

(114b) [This paper is based on a thesis presented to the University of Mexico—for abstract see Helm. Abs., 17, No. 399.]

(114c) López-Neyra & González Castro studied the *in vitro* antibacterial action on various pathogenic bacteria of a saline fluid extract, simple and formolized triturates, alcohol and ether extracts and the alcohol-precipitated fraction of a formolized fluid extract of *Moniezia expansa*, and of a fluid extract and simple desiccated triturates of *Avitellina centripunctata*. *M. expansa* fluid extract was active against *Salmonella typhi*, *Staphylococcus aureus* and *Escherichia coli*. Some dried triturates were active, others were inactivated by the presence of contaminating bacteria, two of which were isolated and are designated *Bacillus Moniezia* I (B.M.₁) and *Bacillus Moniezia* II (B.M.₂); these bacteria were themselves resistant to the action of the triturate and it is suggested that they are able to destroy its antibacterial potency. Formolized triturates were always active and were slightly superior to simple triturates against *Salmonella typhi*. Alcohol and ether extracts of *M. expansa* lacked bactericidal action. The alcohol-precipitated fraction of a formolized extract was fairly active after desiccation, showing almost the same variations as the simple desiccated triturates against *Salmonella typhi*, *S. paratyphi* A and B, *Staphylococcus aureus* and *Escherichia coli*, and being more active against the cholera vibrio. Results with *Avitellina centripunctata* do not so far warrant any conclusions. E.M.S.

(1114e) More than 100 specimens of *Neoreneifer crotali* were found in *Bothrops atrox* in Mexico. Small differences from Self's description are noted but are insufficient to justify the creation of a new species. The species is, however, transferred to the genus *Neochetosoma* [? nomen nudum]. E.M.S.

(1114f) Tarazona Vilas found specimens of *Trichonema parvibursatum*, of which the males only were described by Vaz in Brazil, in the faeces of two donkeys in Barbastro, Spain. On one occasion a copulating pair was found, and on another two males and two females. Descriptions and photomicrographs are given. E.M.S.

(1114g) Four Chamberland broth filtrates and 14 dried triturates of *Moniezia expansa* were tested for antibacterial activity against *Salmonella typhi*. The filtrates were active but unequal, some being bactericidal and other merely bacteriostatic, and their activity decreased unequally on dilution; none were active at dilutions below 25%. The amounts of active principle may vary in different lots of worms, and the process of filtration and the pH may affect their potency. Most of the triturates, whether prepared from whole worms or from the residue left after filtration, and whether dried by heat or in an air current, showed only slight and unequal bacteriostatic activity. It is not clear whether this is due to the same substances which are active in the filtrates or to new substances formed during the preparation of the triturates. E.M.S.

(1114h) López-Neyra has re-examined the type material of *Raillietina madagascariensis* of Cuban origin, *R. demerariensis* from British Guiana, *R. formosana* and *Meggittia celebensis* from Burma, *R. baeri* of African Muridae and more recently *R. quitensis* from Ecuador and *R. loechesalavezi* from Cuba. The first four are accepted as human parasites and keys are given for their identification from the scolex or from immature or gravid proglottides. *R. baeri* is not a human parasite. The synonymy of all these forms is very thoroughly discussed. *R. quitensis* (= *R. ecuatoriensis*) is considered a synonym of *R. demerariensis*, and *R. loechesalavezi*, *R. kouridovali* and *Inermicapsifer cubensis* of *R. madagascariensis*. *R. bakeri* from *Sciurus* and *Sigmodon* is also considered a probable synonym of *R. madagascariensis*. The suggestion is made that honey-ants and termites may serve as intermediaries, since in some regions they are esteemed a delicacy. E.M.S.

115—Revista del Instituto de Salubridad y Enfermedades Tropicales. México.

- a. MARTÍNEZ BÁEZ, M., 1949.—“Consideraciones sobre el examen de los nódulos oncocercosos en la investigación de la acción macrofilaricida de algunas drogas.” 10 (1), 17-27. [English summary p. 24.]

(1115a) Three hundred *Onchocerca* nodules were chosen at random from those excised during a control campaign from previously untreated patients. Histological examination showed abnormalities and degenerative changes in the worms found in 56% of these nodules. Such degenerative changes are therefore not a reliable index of drug action. E.M.S.

116—Rivista di Parassitologia.

- a. LA FACE, L., 1949.—“Su alcune malattie diffuse dalla *Mosca domestica*.” 10 (2), 93-110. [English & French summaries pp. 108-109.]

(1116a) Instances in which *Musca domestica* has been implicated in the mechanical spread of helminth infections are briefly annotated from the publications of Grassi (1883), Stiles (1889), Galli-Valerio (1910?), Nicoll (1911), Tao (1936) and Podyapolskaya & Gnédina (1934). R.T.L.

117—Scientific Agriculture.

- a. HASTINGS, R. J., 1949.—“Concerning the movement of the bulb eelworm, *Ditylenchus dipsaci* (Kuhn) Filipjev, in narcissus bulbs.” 29 (7), 354-355.

(117a) Hastings states that in narcissus bulbs the bulb eelworm may occur in white as well as in brown scales. Infection spreads from scale to scale by way of the basal plate; brown discoloration develops late in the course of infection of a scale. Comparing evidence from British Columbian “Laurens Koster” with evidence from English “King Alfred” he infers that eelworms move more rapidly through British Columbian bulbs. Eelworm wool occurs earlier in British Columbia than in Washington State, New York State or England. This he relates to environmental conditions which, he says, are more favourable for eelworm population development in British Columbia than elsewhere. J.B.G.

118—Scottish Agriculture.

- a. REID, R. D., 1949.—“Strawberry eelworm.” 29 (1), 51-53.

(118a) Reid gives an excellent account of the symptoms seen in strawberry plants infested with *Aphelenchoides fragariae*, describing plants showing symptoms of the spring dwarf, red plant, cauliflower and crimp types. For the control of the disease he recommends a positive policy of propagation only from healthy plants rather than the less sure method of roguing plants showing signs of disease. A recent case in Scotland is also mentioned of severe infection of a plantation of strawberries with the stem eelworm, *Anguillulina dipsaci*, producing symptoms best described as “crimp”. M.T.F.

119—South African Medical Journal.

- a. BENNIE, I., 1949.—“Urinary schistosomiasis: the best time to obtain specimens; the effect of specific therapy on egg output.” 23 (6), 97-100.

(119a) The daily average number of schistosome eggs in 0.25 c.c. of urinary deposit from a young African labourer during a consecutive period of 23 days was 11 in the morning and 446 in the afternoon. The afternoon increase was attributable to physical exertion involving the use of the abdominal muscles. The common practice of examining the terminal urine from an early morning specimen may therefore be misleading. A table gives the egg output of one of the cases treated with Miracil-D by Blair, Hawking, Meeser & Ross (1948). The number of eggs diminished rapidly and no viable eggs were found nine days after the end of treatment. Those miracidia which were hatched from eggs passed after the fourth day of treatment seldom survived more than eight hours, whereas before treatment the miracidia were active for over 24 hours at room temperature. R.T.L.

120—Transactions of the American Microscopical Society.

- a. WALTON, A. C., 1949.—“Parasites of the Ranidae (Amphibia). VII.” 68 (1), 49-54.
 b. WEBSTER, J. D., 1949.—“Records of *Ophryocotyle* (Cestoda: Davaineidae) from shore birds.” 68 (2), 104-106.
 c. JOHNSON, W. F., 1949.—“A new species of trematode, *Podocotyle gibbonsia*, from tide pool fishes of Monterey Bay, California.” 68 (2), 107-109.
 d. BASIR, M. A., 1949.—“The excretory system of *Physaloptera varani* Parona 1889.” 68 (2), 118-122.
 e. BASIR, M. A., 1949.—“An easy method for the preparation of *en face* view of small nematodes.” 68 (2), 123-126.

(120b) *Ophryocotyle alaskensis* n.sp. from *Haematopus bachmani* is distinguished from *O. insignis* by having fewer undulations in its double row of rostellar hooks, fewer testes, and a longer cirrus pouch. Specimens doubtfully identified as *O. insignis* which were recovered from *Catoptrophorus semipalmatus* in Texas had fewer testes and ovarian lobes and were smaller in total size than typical *O. insignis*. R.T.L.

(120c) *Podocotyle gibbonsia* n.sp. from *Gibbonsia elegans* and *Caularchus meandricus* differentiated from *P. apodichthysi*. R.T.L.

(120d) The excretory system of *Physaloptera varani* is of the inverted-U type consisting of two posterior lateral excretory ducts united anteriorly through a bridge to open into a short excretory sinus. At its anterior end the sinus receives the terminal excretory duct which opens externally through the excretory pore. The whole system has a total of two nuclei, one in the cytoplasmic wall of the terminal excretory duct and the other in that of the sinus. R.T.L.

(120e) As a modification of Cobb's method of preparing the head end of small nematodes and nematode larvae for *en face* view it is suggested that the head end should be cut on a glass slide in a thin streak of solidified glycerin jelly and then manipulated into position in melted jelly or glycerin. R.T.L.

121—Transactions of the Royal Society of Tropical Medicine and Hygiene.

- a. BAYLIS, H. A., 1949.—"A new human cestode infection in Kenya. *Inermicapsifer arvicanthidis* a parasite of rats." 42 (6), 531-542.
- b. WOODMAN, H. M., 1949.—"Filaria in the Anglo-Egyptian Sudan." 42 (6), 543-558.
- c. GELFAND, M. & ROSS, W. F., 1949.—"The incidence of schistosomiasis in South Central Africa." 42 (6), 559-564.
- d. CLARK, M., 1949.—"Lymphostatic verrucosis." [Correspondence.] 42 (6), 629.
- e. BUCKLEY, J. J. C., 1949.—"a. Cysticerci in liver and lung of ring-tailed lemur. b. Living miracidia and embryonated egg of *Paragonimus* from Indian leopard cat. c. *Enterobius vermicularis* in intestinal wall." [Demonstration.] 43 (1), 2.
- f. LEROUX, P. L., 1949.—"Abnormal adaptations and development of schistosomes in experimental animals." [Demonstration.] 43 (1), 2-3.
- g. BERTRAM, D. S., 1949.—"Infection of the immature stages of the mite *Liponyssus bacoti* with *Litomosoides carinii*, the filarial parasite of the cotton rat." [Demonstration.] 43 (1), 3-4.
- h. MALAMOS, B., 1949.—"Tropical diseases in Brazil." 43 (1), 11-30. [Discussion pp. 30-32.]

(121a) Baylis gives a detailed description of *Inermicapsifer arvicanthidis* (Kofend., 1917), two specimens of which were obtained after anthelmintic treatment from a two-years-old boy who had recently come to England from Nairobi. The presence of 4-6 ventral longitudinal excretory canals, interconnected by transverse vessels, is observed for the first time in this species. A list is provided of the 14 species of Muridae which are known to be hosts of *I. arvicanthidis* and the localities in Africa whence the parasite has been recorded in them. The relationship of this species with *I. cubensis* of man in Cuba is discussed and it is suggested that the two may be identical; as *I. cubensis* is the only species in America of this predominantly African genus it is thought that it may have been introduced from West Africa. In a discussion of the transmission of Anoplocephalidae, the idea is put forward that the egg capsules of *Inermicapsifer* appear to be too large to be ingested by mites and that insects are more likely intermediate hosts. Doubt is expressed as to whether *Inermicapsifer* is correctly classified in the Anoplocephalidae; its close affinities with *Raillietina* suggest that it might be more appropriately contained in the family Davaineidae. J.J.C.B.

(121b) Woodman summarizes recent knowledge concerning filarial infections in southern Anglo-Egyptian Sudan, which comprise *Wuchereria bancrofti*, *Loa loa*, *Acanthocheilonema perstans* and *Onchocerca volvulus*. "*Agamofilaria*" *streptocerca* has not been found. He recounts the results of a preliminary survey for *O. volvulus* infection recently carried out on people of the Azande tribe. Population samples were examined in two localities on the river Sué, 100 miles apart; the skin infection rate with microfilariae of *O. volvulus* was 50% and 88% respectively in persons showing signs of abnormalities possibly due to filariasis. The microfilariae were also seen in 77% of a group of apparently healthy persons. Reference is made to the vectors of *L. loa* in southern Sudan, to preventive measures and chemotherapy in filariasis, and to skin antigen tests with material prepared from avian filarial worms. J.J.C.B.

(121c) Post-mortem examination at Salisbury, Southern Rhodesia, of bladders and rectums of 150 adult Africans (115 males and 35 females) by a digestion technique revealed

bilharzia eggs in 98%. As the Africans came from widely distributed areas in South Central Africa, including Southern Rhodesia, Northern Rhodesia, Nyasaland, Portuguese East Africa and Portuguese West Africa, it is inferred that the incidence of the infection in South Central Africa is far higher than is indicated by previous surveys in which other techniques of examination have been employed. Of the 147 positive cases 146 had *Schistosoma haematobium* infection (99.3%), 72 had *S. mansoni* infection (48.9%), and 71 had both *S. haematobium* and *S. mansoni* (48.3%). Rectal and bladder snips were also examined and the results showed that this method is not as accurate as the digestion method, but that rectal snips are useful in diagnosing *S. haematobium* infection: in 134 cases positive for *S. haematobium* infection in the bladder, 92 rectal snips (68.6%) revealed eggs of this species. J.J.C.B.

(121d) Clark points out that the lymphostatic verrucosis described by him (1948) from the Fort Hall district of Kenya, and which White [see Helm. Abs., 18, No. 43k] suggested might be produced by *Schistosoma haematobium* cercariae, cannot be due to this parasite as it does not occur in that area. It is, however, possible that White's case is not of the same condition as those seen by Clark. R.T.L.

(121f) leRoux exhibited specimens of various schistosome species showing unusual or abnormal characters in experimental hosts, and also demonstrated abnormal conditions in natural hosts produced by too drastic anthelmintic treatment. He also showed some material relevant to the synonymy of these species and of their intermediaries. E.M.S.

(121g) In *Liponyssus bacoti* taken from one host the percentage rates of infection with infective stages of *Litomosoides carinii* were 76% of the adult female mites and 12% of the protonymphs. The mean number of worms per adult female mite was 5.96 while that of the protonymphs was 0.12. The lesser intensity in the latter is probably attributable to the smaller amount of blood ingested. R.T.L.

122—Veterinary Medicine.

- a. ENGARD, P. T., 1949.—"Parasitisms in sheep." 44 (5), 210-214.
- b. BAILEY, W. S. & WILLIAMS, A. G., 1949.—"Vermineous pneumonia in the cat." 44 (6), 267-269.

(122a) For stomach worms, Engard recommends the administration by stomach tube of a phenothiazine suspension carrying 3.5 drams per ounce, diluted by the addition of an equal volume of rain water or skimmed milk. For lungworms the intratracheal injection of equal parts of "pyrethrol five" and "deobase" in 5-c.c. doses, and intravenous injection of iodine in potassium iodide solution, are stated to give good results. R.T.L.

(122b) Bailey & Williams report the occurrence of a case of fatal pneumonia due to *Aelurostrongylus abstrusus* in a kitten from Chattanooga, Tennessee. The pathological lesions are described. Photographs illustrate the larvae in the bronchioles and the associated exudate, the adults in the lung tissue, and the eggs and larvae in the alveolar spaces. R.T.L.

123—Veterinary Record.

- a. RUSSELL, A., 1949.—"The control of parasites (helminths)." [In: "The control of parasites in relation to preventive veterinary medicine." Discussion by the Central Veterinary Society.] 61 (19), 238-239. [General discussion pp. 240-243.]
- b. GOULD, G. N., 1949.—"Some conditions of veterinary interest in goats." 61 (20), 261-262. [Discussion pp. 263-264.]
- c. JAMIESON, S. & THOMSON, A., 1949.—"Studies in black disease. II.—The value of *Cl. oedematiens* toxoid and anaculture together with carbon tetrachloride therapy in the control of the disease." 61 (28), 399-402.
- d. GIBSON, T. E., 1949.—"Further observations on the effect of small repeated doses of phenothiazine on strongylid infection in the horse." 61 (31), 451-455.
- e. KENDALL, S. B., 1949.—"Species of *Lymnaea* as intermediate hosts of *F. hepatica*." [Correspondence.] 61 (31), 462.
- f. GORDON, H. McL., 1949.—"Phenothiazine and oesophagostomiasis." [Correspondence.] 61 (33), 509-510.

(123a) Although pasture management offers a very promising means of control for strongylosis in horses and parasitic gastro-enteritis in ruminants ley farming has given disappointing results, for the rate of stocking, not the age of a pasture, governs the level of pasture infestation. Hall's dictum "Permanent pastures perpetuate parasites" has no foundation. Even a short rest of pasture is very beneficial, for the initial death-rate of larvae in heavily infested pastures is very high and a dangerously high infestation may be reduced in a few weeks to negligible proportions. A combination of anthelmintic treatment and pasture rotation should result in a minimum parasite burden; but young animals reared free from infection do not develop resistance and may quickly succumb if exposed on heavily contaminated pastures later in life. The use of phenothiazine-salt licks for sheep on hill pastures does not ensure adequate dosing owing to their low salt requirements. In the discussion on this paper Taylor expressed the view that an admixture with resistant adult stock was an advantage to susceptible young stock, as the adult animals returned to the pastures only one-tenth of the eggs returned by young stock. The use of small doses of phenothiazine over a long period, by inhibiting the development of helminth eggs, kept the pastures relatively free from infection but might eventually result in phenothiazine-resistant strains.

R.T.L.

(123b) For clinical parasitic gastro-enteritis, which frequently occurs in goats, the provision of 1% pure copper sulphate salt licks is useful. As phenothiazine in full doses may cause reddening of the skin in white goats, and of the milk, some breeders prefer to give a 1% solution of copper sulphate in medicinal doses for five days. Taeniasis also responds to copper sulphate medication.

R.T.L.

(123c) For the control of "black disease", artificial immunity to the toxins of *Clostridium oedematiens* must be established at the same time as the adoption of measures for combating *Fasciola hepatica* infection. Of three antigens prepared from "black disease" strains of *Cl. oedematiens*, viz., a toxoid, an alum-precipitated toxoid, and a formalinized whole culture (anaculture), it is shown that under field conditions toxoid reduced mortality to one-half to one-third of that in the controls, while anaculture reduced the mortality to about one-quarter of that of the toxoid group.

R.T.L.

(123d) A pony kept continuously in a loose box for a year was given 1.0 gm. of phenothiazine daily mixed with a small amount of damp bran and oats. Weekly egg counts showed a drop from 1,400 to 2 eggs per gramme of faeces in the first four weeks and then to zero during the remainder of the treatment period and for the succeeding five weeks. Thereafter the egg count rose gradually until, by the 13th week after the cessation of treatment, it had reached 500 e.p.g. There were no ill-effects. In a second experiment two ponies were kept on an acre of pasture for six months without treatment; they were then similarly treated for 12 months, and afterwards maintained on the paddock without treatment for a further six months. The egg count dropped from 1,910 to 130 e.p.g. by the 23rd week, before any treatment was given. A fortnight after treatment commenced the egg count virtually fell to nil for the remainder of the 12 months of treatment. This is attributed to the inhibitory effect of treatment on egg production and not to the elimination of the parasites, for a rapid rise in the egg count followed soon after the cessation of treatment. Weekly larval counts of the herbage from the paddock are tabulated. These fell to a very low level six weeks after the commencement of treatment, but about 13 weeks after its cessation the counts rose rapidly and eventually reached a very high level. The advantages to be gained from the above method should be carefully weighed against possible untoward occurrences.

R.T.L.

(123e) Kendall has observed that complete development of *Fasciola hepatica* takes place in a high proportion of newly hatched specimens of *Limnaea glabra* and *L. palustris* exposed to mass attack by large numbers of miracidia, but as their susceptibility is apparently limited to a few days after hatching it is unlikely that these species play an important role in the spread of liver-fluke. Although at all stages of growth *L. truncatula*

is highly susceptible to infection it is seldom that more than 5-6% are found naturally infected in the field.

R.T.L.

(123f) Gordon, in reply to statements by Russell and by leRoux, suggests that epidemiological considerations may affect the efficiency of phenothiazine in oesophagostomiasis in sheep. He records that in 159 sheep in Australia this drug was 100% efficient in 35.2%, 70-100% efficient in 79.8% and less than 50% in 8.1%. The failure of the drug to control oesophagostomiasis in sheep in Australia is attributed to conservative use owing to its high cost. It is believed that the larvae of *O. columbianum* can stay in the nodules in the bowel wall for periods up to a year. Eradication of this ovine helminth is considered costly and impracticable in Australia. The successful control of this parasite by phenothiazine medication in Canada is attributed to climatic conditions which are unfavourable for its optimal development outside the host and to the method of sheep husbandry, and not because the parasite is more vulnerable to the drug there than in Australia where sheep are not housed during the winter.

P.L.leR.

124—Vierteljahrsschrift der Naturforschenden Gesellschaft in Zürich.

- a. ACKERKNECHT, E., 1949.—"Haustierkrankheiten als Gefahr für den Menschen (Anthropozoonosen)." [Abstract of paper presented to the Naturforschenden Gesellschaft in Zürich, December 13, 1948.] 94 (1), 64-65.

125—Wiener Tierärztliche Monatsschrift.

- a. GEBAUER, O., 1949.—"Ein Beitrag zur Früh- und Differentialdiagnose des Onchocercen-Befalles bei Widerristfisteln." 36 (1), 26-28.
- b. HABERLIK, W., 1949.—"Lebervergrößerung durch Hülswürmer bei einem Schwein." 36 (6), 326.

(125a) Gebauer relates briefly his experiences with fistulous withers during military service in Russia. Wounds and fistulae, according to their aetiology, are divided into three groups. (i) Chafing by harness, especially during prolonged wet weather, provokes a dermatitis which ultimately involves the subcutis, and abscess formation is followed by fistula. (ii) Injuries caused by harness and saddle. Here he recognizes two forms: (a) subcutaneous haematomas which become septic and suppurate, and (b) damage to the skin without its immediate separation from the subcutaneous tissues. Necrosis of the skin produces wounds which suppurate and fistulae develop; there is a phlegmosis. (iii) Affections of the withers with the skin still intact are accepted as being due to onchocerciasis. The swellings develop slowly and are bilateral to the spinous processes. The horse does not resent palpation of the swellings. There is no inflammation of the lymphatics while the skin remains intact. Fistulous withers due to onchocerciasis are much less common than those due to other causes.

P.L.leR.

126—Zeitschrift für Tropenmedizin und Parasitologie.

- a. GÖNNERT, R., [1949].—"Die Struktur der Körperoberfläche von *Bilharzia mansoni* (Sambon 1907)." 1 (1), 105-112.

(126a) Gönner describes the cuticular spination of *Schistosoma mansoni* freshly collected from mice and fixed with Bouin's fixative. He found that the overlap along the closure of the gynaecophoric canal might be from left to right or from right to left, even in specimens derived from a single miracidium, and thus is not a specific or an inherited characteristic. The dorsal surface of the male bears numerous long fine spines in groups on the tubercles except at its underlapping edge which bears much stouter spines directed outwards. These interlock with similar inwardly directed spines on the overlap section of the ventral surface to maintain the closure of the gynaecophoric canal. The rest of the ventral surface bears very short stout spines. The female carries only a few lines of very slender spines. The oral and ventral suckers are similarly spined in both sexes. E.M.S.

NON-PERIODICAL LITERATURE

127—INTERNATIONAL CONGRESS FOR MICROBIOLOGY (4th),
Copenhagen, July 20-26, 1947.

- a. DESCHIEENS, R. & LAMY, L., 1949.—"Les hyphomycètes prédateurs des larves de nématodes parasites des végétaux et des plantes." Report of Proceedings, Section VI, pp. 406-407.
- b. OVERGAARD, C., 1949.—"Freeliving nematodes and soil microbiology." Report of Proceedings, Section VII, pp. 483-484. [Discussion pp. 484-485.]

(127a) Deschiens & Lamy discuss the possibility of the prophylactic use of nematode-trapping fungi such as *Dactylaria*, *Dactylella* and *Arthrobotrys* in the control of plant-parasitic nematodes. They point out that the fungi can be cultivated and their spores distributed by appropriate methods and also that they have no unfavourable effect on plant growth. T.G.

(127b) Overgaard studied the free-living nematodes from four soil types: (i) a sandy pasture, (ii) a peaty meadow of high moisture content, (iii) a dry sandy field, and (iv) a sandy loam carrying a rye crop. The nematodes from the different sites showed large quantitative and some qualitative differences. They can be arranged in four nutritional groups: (a) *Tylenchus* etc. feeding on plant juices, (b) *Dorylaimus* etc. feeding mainly on soil algae, (c) *Mononchus* etc. mainly predatory and carnivorous, (d) *Rhabditis* etc. feeding mainly on bacteria. Overgaard estimated the weight of the nematodes per square metre of the four soil types and their numbers according to these feeding groups. He concludes that in moist soil the bulk of the nematodes feed on bacteria and so tend to reduce bacterial numbers, but since not all kinds of bacteria can serve as food for nematodes the significance of the latter in soil microbiology cannot yet be evaluated. Measurements of nematode respiration show that it is about ten times that of earthworms and Overgaard suggests that the importance of nematodes in the microbiological balance of the soil population has, so far, been neglected. T.G.

- 128—KOUTZ, F. R., 1949.—"Check list of parasites of domestic animals reported in Ohio." Columbus: Ohio State University, 14 pp.

This check list of Ohio parasites records 2 cestodes and 7 nematodes in the cat; 2 trematodes, 6 cestodes, 11 nematodes and one acanthocephalan in the dog; 3 trematodes, 2 cestodes and 10 nematodes in cattle; 4 cestodes and 18 nematodes in the horse; one trematode, 4 cestodes and 18 nematodes in sheep and goats; 9 nematodes and one acanthocephalan in the pig; 8 cestodes and 8 nematodes in poultry. There is also a list of references. R.T.L.

- 129—THORNTON, H., 1949.—"Textbook of meat inspection. Including the inspection of rabbits, poultry and fish." London: Baillière, Tindall & Cox, xi+659 pp., 50/-.